THE MIRIAM HOSPITAL

Certificate of Need Application of The Miriam Hospital

The DaVinci Surgical System

Resubmitted July 3, 2006

Lifespan

Certificate of Need Application Instructions

Please respond to every question unless directed to do otherwise. When you have completed the application, submit **3 copies** of the completed application* to the Office of Health Systems Development, Rhode Island Department of Health, 3 Capitol Hill, Room 407, Providence, Rhode Island 02908. Upon submission, the application will be reviewed for acceptability, and within ten (10) working days the applicant will be notified of any deficiencies if the application has been found not acceptable in form. Applications found substantially deficient may not be reviewed in the current cycle. Thus, a complete response to every question in this application and its relevant appendices may save valuable time.

This application should be completed only after a thorough review of Chapter 15, Title 23, of the General Laws of Rhode Island 1956, as amended, and the Rules and Regulations for Determination of Need for New Health Care Equipment and New Institutional Health Services (R23-15 CON). The Rules and Regulations can be found on the Internet at
http://www.rules.state.ri.us/rules/released/pdf/DOH/DOH_155_.pdf

Several questions in this application form and its appendices require the use of additional sheets of paper. On separate sheets of paper, please identify the application questions to which they apply, and please attach the separate sheets of paper either to the page in the application on which the question appears or at the end of the application under an individual tab. Each separate answer sheet to a question should be numbered with the number of the question from the application plus a consecutive lower case letter. Please indicate 'N/A' next to any question that does not pertain to the proposal. Included with this application form are several appendices. Please complete those appendices which are applicable to your proposal and include them with the application.

The application must be submitted in a softbound format to facilitate the mailing of the application to the members of the Health Services Council.

Once the application is deemed acceptable for review, **25 copies** of the completed application including all the satisfied deficient materials must be submitted to the Office of Health Systems Development prior to the date of review initiation.

All questions concerning this application should be directed to the Office of Health Systems Development at
(401) 222-2788.

*Applicants need not copy this page nor appendices not applicable to this proposal.

Rhode Island Department of Health
Office of Health Systems Development
3 Capitol Hill, Room 407
Providence, Rhode Island 02908

Certificate of Need Application Fee Instructions

Any applicant proposing to file a certificate of need (CON) proposal must include an application fee at the time of submission.

Pursuant to section 23-15-10 RIGL, the application fee requirements are as follows*:

1) Applicants shall submit an application fee prior to requesting any CON review of matters pursuant to the requirements of this chapter; except that health care facilities owned and operated by the State of Rhode Island shall be exempt from this application fee.

2) The application fee shall be paid by check and made payable to the **Rhode Island General Treasurer**

3) For expeditious review proposals, the applicant shall include an application fee of $750 per application **plus** an amount equal to one third of one percent (.33%) of the total capital expenditure costs associated with the application.

4) For all other proposals, the applicant shall submit an application fee of $500 per application **plus** an amount equal to one third of one percent (.33%) of the total capital expenditure costs associated with the application.

5) Application fees for applications accepted for review shall be non-refundable. Should your application be deemed unacceptable for review, the check for the application fee will be returned.

All questions concerning this application should be directed to the Office of Health Systems Development at (401) 222-2788.

*Applicants need not copy this page nor appendices not applicable to this proposal.

Rhode Island Department of Health
Office of Health Systems Development
3 Capitol Hill, Room 407
Providence, Rhode Island 02908

Certificate of Need Application

Name of Applicant: **The Miriam Hospital**

Title of Application: **The Da Vinci Surgical System**

Date Application Submitted: **June 10, 2006**

Amount of Fee: **$6,143**

Pursuant to Chapter 15, Title 23 of The General Laws of Rhode Island, 1956, as amended, and Rules and Regulations for Determination of Need for New Health Care Equipment and New Institutional Health Services (R 23-15- CON)

All questions concerning this application should be directed to the Office of Health Systems Development at (401) 222-2788.

Please have the appropriate individual attest to the following:

"I hereby certify that the information contained in this application is complete, accurate and true."

Kathleen C Withers MD 6/27/06

signed and dated by the President or Chief Executive Officer

Certificate of Need Application

1.) Date Submitted: **July 3, 2006**

2.) Brief Descriptive Title of Proposal: **The Da Vinci S Surgical System**

3.) Brief Summary Description of Proposal (Please confine your summary to the space provided.

The Miriam Hospital (TMH) is proposing to implement a Da Vinci S Surgical System to provide the demonstrated benefits of superior outcomes and lower costs resulting from state-of-the-art minimally invasive robotic surgery to the residents of Rhode Island. The Da Vinci is a mobile unit that can be rolled in and out of the Operating Room, with no construction or renovation other than an electrical circuit that needs to be run into robotics room, with the capital cost being $1,710,000, $1,700,000 for the Da Vinci system and $10,000 for the electrical circuit. More specifically, TMH proposes to use the Da Vinci System in connection with protstatectomy, mitral valve repair and foregut surgical cases, avoiding the need for open surgical procedures with prostate cancer patients, and more invasive surgical procedures for mitral valve repair and foregut surgical cases.

As far coronary artery bypass surgery is concerned, robotic assisted cardiac surgery falls into 2 categories - valve repairs, primarily mitral, and robotic assisted mobilization of the internal mammary artery without sternal splitting which allows on or off pump bypass through a left anterior thoracotomy, decreasing postoperative pain and pulmonary compromise. As stated above, TMH will be training surgeons in robotic mitral valve repair, an area the hospital is already involved in on a conventional basis. At some point in the future, it is likely that robotic IMA mobilization will be introduced as well. However, prior to doing so, TMH will contact the Department to discuss its plans and confirm the required regulatory reviews.

The are numerous benefits resulting from robotic assisted surgery for the patient. Compared to traditional radical prostatectomy robotic protstatectomy provides for shorter post surgical recovery periods; less blood loss; fewer transfusions; lower risk of infections, impotence and incontinence; and significantly reduced pain. Robotic-assisted mitral valve repair avoids the drawbacks of traditional open chest heart surgery, including blood loss, pain and scarring, and generally results in shorter hospital stays, faster recovery, less risk of infection and quicker return to normal activities. Robotic assisted foregut surgery reduces the risk of perforation and is also applicable to mobilization of the thoracic esophagus during resection avoiding thoracotomy or blunt esophagectomy.

The use of robotic assisted surgical techniques will also benefit TMH in the continued development of its surgical staff with individuals who have state-of-the-art expertise in the area of minimally invasive surgery. All but four states in the US currently have this technology in place, and given this national adoption and the superior outcomes demonstrated by this technology, many young surgeons are interested in working in a surgical environment offering this important tool. In addition, the shorter length of stays, lower risk of infection and reduced use of blood bank services associated with robotic assisted surgery is expected to reduce the overall cost to the patient for prostatectomy, mitral valve repair and foregut surgical cases.

By bringing robotic surgical technology to the state, Rhode Island residents have an important treatment option thereby eliminating the need to travel state-of-the-art robotic surgery.

4.) Capital Cost of Proposal (from response to Questions 41 and 42):

$1,716,143

5.) Operating Cost of Proposal (first full year after implementation, from response to Question 49):

$893,000

6.) Month and year the proposal would be implemented (i.e. services first offered assuming approval):

January 1, 2007

7.) Name and address of Applicant, including zip code:

The Miriam Hospital, 164 Summit Avenue, Providence, RI 02906

8.) Name and address of facility (if different from applicant):

Same

9.) Name, address, telephone, e-mail and fax number of Chief Executive Officer:

Kathleen Hittner, President and Chief Executive Officer, The Miriam Hospital, 164 Summit Avenue, Providence, RI 02906 (401) 793-2005 (tel.), khittner@lifespan.org, (401),793-7587 (fax)

10.) Name, title, address, telephone, e-mail and fax number of person to contact regarding this application:

Russell Gross, Planning Manager, Lifespan, 167 Point Street, Providence, RI 02903, (401) 444-7423 (tel.), rgross@lifespan.org, (401) 444-4857 (fax)

11.) Facility license number: **HOS00122** Medicare provider number: **41-0012**

12.) Are you requesting an "expeditious review" for this application? Yes____ No **X**
- If the response to Question 12 is 'Yes', please complete Appendix A

13.) Are you requesting an "accelerated review" for this application? Yes____ No **X**
- If the response to Question 13 is 'Yes', please provide a brief justification for the accelerated review.

14.) List all officers, members of the board of directors, trustees, stockholders, partners and other individuals who have an equity or otherwise controlling interest in the applicant. For each individual, provide their home and business address, principal occupation, position with respect to the applicant, and amount, if any, of the percentage of stock, share of partnership, or other equity interest that they hold **See Attachment 1**

15.) For each individual listed in response to Question 14, list all (if any) other health care facilities or entities within or outside Rhode Island in which he or she is an officer, director, trustee, shareholder, partner, or in which he or she owns any equity or otherwise controlling interest. For each individual, please identify: A) the relationship to the facility and amount of interest held, B) the type of facility license held (e.g. nursing facility, etc.), C) the address of the facility, D) the state license #, E) Medicare provider #, and F) any professional accreditation (e.g. JACHO, CHAP, etc.).
See Attachment 1

16.) If any individual listed in response to Question 14, has any business relationship with the applicant, including but not limited to: supply company, mortgage company, or other lending institution, insurance or professional services, please identify each such individual and the nature of each relationship.
See Attachment 1

17.) Have any individuals listed in response to Question 14 been convicted of any state or federal criminal violation within the past 20 years? Yes___ No __X__.
• If response to Question 17 is 'Yes', please identify each person involved, the date and nature of each offense and the legal outcome of each incident.

The applicant is unaware of any convictions within the past 20 years of any of the individuals listed in the response to Question 14.

18.) Please provide organization chart for the applicant, identifying all "parent" entities with direct or indirect ownership in or control of the applicant, all "sister" legal entities also owned or controlled by the parent(s), and all subsidiary entities owned by the applicant. Please provide a brief narrative clearly explaining the relationship of these entities, the percent ownership the principals have in each (if applicable), and the role of each and every legal entity that will have control over the applicant.

See organizational charts on Page 7.

19.) Please list all licensed healthcare facilities (in Rhode Island or elsewhere) owned, operated or controlled by any of the entities identified in response to Question 18 (applicant and/or its principals). For each facility, please identify: A) the entity, applicant or principal involved, B) the type of facility license held (e.g. nursing facility, etc.), C) the address of the facility, D) the state license #, E) Medicare provider #, and F) any professional accreditation (e.g. JACHO, CHAP, etc.).

See listing on Pages 8 - 11

20.) Have any of the facilities identified in Question 19 had: A) federal conditions of participation out of compliance, B) decertification actions, or C) any actions towards revocation of any state license?
Yes ___ No _X
• If response to Question 20 is 'Yes', please identify the facility involved, the nature of each incident, and the resolution of each incident.

21.) Have any of the facilities owned, operated or managed by the applicant and/or any of the entities identified in Question 19 during the last 5-years had bankruptcies and/or were placed in receiverships?
Yes___ No _X
• If response to Question 21 is 'Yes', please identify the facility and its current status.

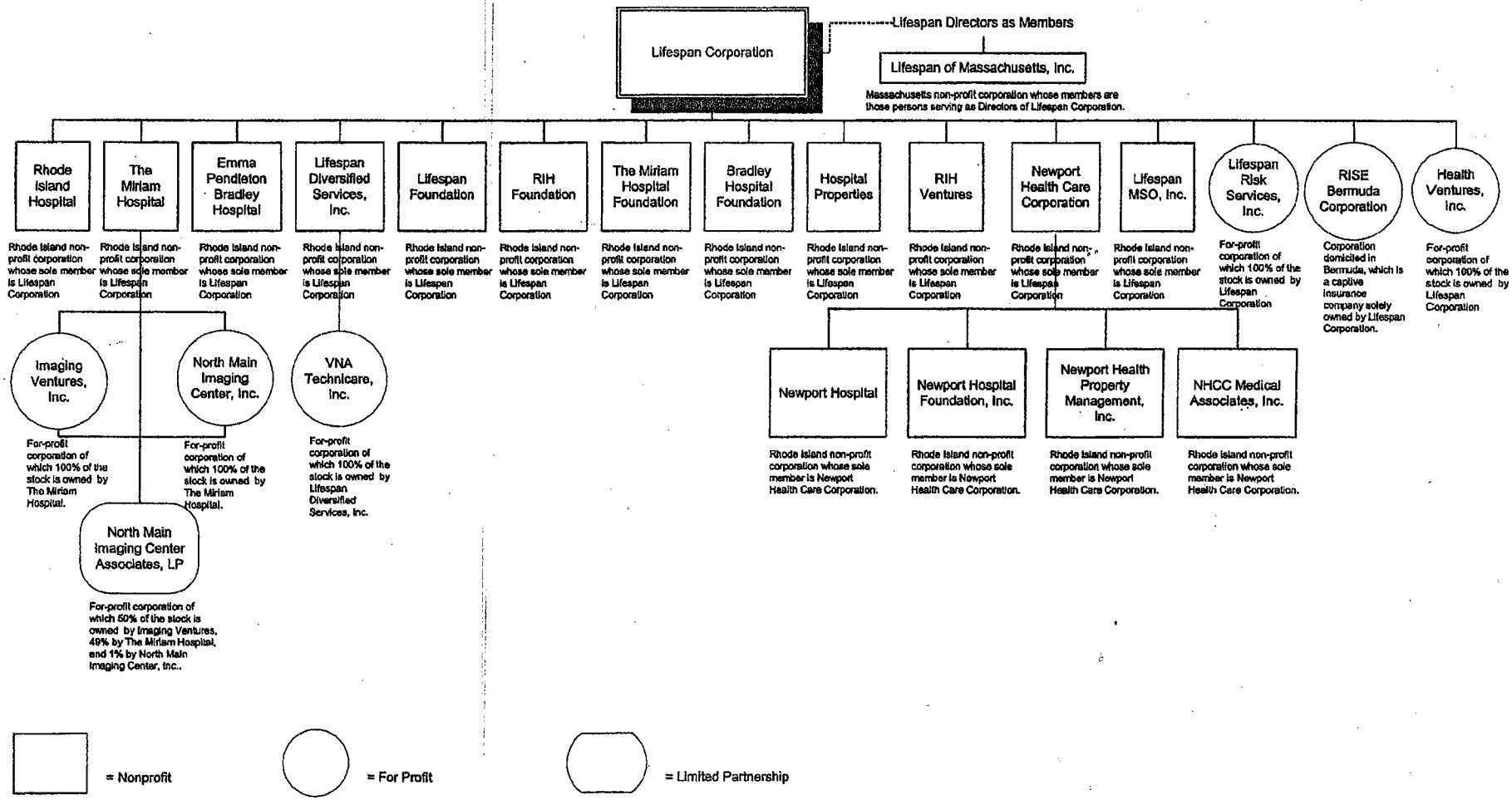
22.) If the applicant is a partnership, please attach a copy of the Certificate of Partnership and the Partnership Agreement. If the applicant is a corporation, please attach a copy of the Certificate of Incorporation, the Articles of Incorporation and the By Laws. If the applicant is a limited liability company, please attach a copy of the Certificate of Organization, the Articles of Organization and the Operating Agreement.

See Attachment 2

23.) Please place an 'X' next to each category that best describes the facility named in Question 8.
_X_ Hospital
___ Nursing facility
___ Inpatient rehabilitation center (including drug/alcohol treatment centers)
___ Freestanding ambulatory surgical center
___ Inpatient hospice
___ Other (specify) _____

24.) Please place an 'X' next to the category that best describes the ownership of the facility.
_X_ non-profit ___for-profit

Corporate Structure



May 9, 2006

1. A. The Miriam Hospital
   B. 164 Summit Avenue
      Providence, RI 02906
   C. Hospital License #: HOS00122
   D. Medicare Provider #: 41-0012
   E. Professional Accreditations: JCAHO and CAP

2. A. TMH Laboratory
   B. 1 Hoppin Street
      Providence, RI 02903
   C. Hospital License #: HOS00122-03
   D. Professional Accreditations: CAP

3. A. TMH Laboratory
   B. 1 Commerce Street
      Lincoln, RI 02865
   C. Hospital License #: HOS00122-04
   D. Professional Accreditations: CAP

4. A. TMH Laboratory
   B. 400 Bald Hill Road
      Warwick, RI 02886
   C. Hospital License #: HOS00122-05
   D. Professional Accreditations: CAP

5. A. RISE TB Clinic
   B. 14 Third Street
      Providence, RI 02906
   C. Hospital License #: HOS00122-06
   D. Professional Accreditations: JCAHO

6. A. TMH Behavioral Medicine Clinic
   B. 1 Hoppin Street
      Providence, RI 02903
   C. Hospital License #: HOS00122-07
   D. Professional Accreditations: JCAHO

7. A. TMH Immunology Research Center
   B. 14 Third Street and 11 Fourth Street
      Providence, RI 02906
   C. Hospital License #: HOS00122-08

8. A. TMH Weight Control & Diabetes Research Center
   B. 196 Richmond Street
      Providence, RI 02903
   C. Hospital License #: HOS00122-10

9. A. TMH Outpatient Rehabilitation Services
   B. 195 Collyer Street
      Providence, RI 02904
   C. Hospital License #: HOS00122-11

10. A. TMH Cardiac Rehabilitation/Pulmonary Rehabilitation Center
    B. 208 Collyer Street
    Providence, RI 02904
    C. Hospital License #: HOS00122-12
    D. Professional Accreditations: JCAHO

11. A. TMH Diagnostic Imaging Center
    B. 195 Collyer Street
    Providence, RI 02904
    C. Hospital License #: HOS00122-13
    D. Professional Accreditations: JCAHO

12. A. TMH Pre-admission Testing Center
    B. 208 Collyer Street
    Providence, RI 02904
    C. Hospital License #: HOS00122-14
    D. Professional Accreditations: JCAHO

13. A. Emma Pendleton Bradley Hospital
    B. 1011 Veterans Memorial Parkway
    East Providence, RI 02915
    C. Hospital License #: HOS00123
    D. Medicare Provider #: 41-4003
    E. Professional Accreditations: JCAHO

14. A. Bradley Research Center
    B. 1 Hoppin Street
    Providence, RI 02903
    C. Hospital License #: HOS00123-01

15. A. Newport Hospital
    B. 11 Friendship Street
    Newport, RI 02840
    C. Hospital License #: HOS00127
    D. Medicare Provider #: 41-0006
    E. Professional Accreditations: JCAHO, CARF, and CAP

16. A. Jamestown Family Practice Center (Offices of Drs. J. England and K. Murray)
    B. 20 Southwest Avenue
    Jamestown, RI 02835
    C. Hospital License #: HOS00127-01
    D. Professional Accreditations: JCAHO, CARF, and CAP

17. A. Vanderbilt Rehabilitation Center
    B. 150 Hope Street
    Bristol, RI 02809
    C. Hospital License #: HOS00127-02
    D. Professional Accreditations: JCAHO, CARF, and CAP

18. A. Family Physicians of Tiverton/Little Compton (Offices of Drs. W. Keigwin and J. Miniutti)
    B. 1800 Main Road
    Tiverton, RI 02878
    C. Hospital License #: HOS00127-03
    D. Professional Accreditations: JCAHO, CARF, and CAP

19. A. Family Physicians of Newport (Offices of Drs. D. Derolf and W. Levin)
    B. 19 Friendship Street
    Newport, RI 02840
    C. Hospital License #: HOS00127-04
    D. Professional Accreditations: JCAHO, CARF, and CAP

20. A. Rhode Island Hospital
    B. 593 Eddy Street
    Providence, RI 02903
    C. Hospital License #: HOS00121
    D. Medicare Provider #: 41-0007
    E. Professional Accreditations: JCAHO and CAP

21. A. RIH Outpatient Psychiatry
    B. 235 Plain Street
    Providence, RI 02905
    C. Hospital License #: HOS00121-01
    D. Professional Accreditations: JCAHO and CAP

22. A. RIH Lab at the Office of Louis J. Moran, M.D.
    B. 1035 Post Road
    Warwick, RI 02886
    C. Hospital License #: HOS00121-04
    D. Professional Accreditations: CAP

23. A. RIH Lab at the Office of Hugo Yamada, M.D.
    B. 6 Blackstone Valley Place
    Lincoln, RI 02865
    C. Hospital License #: HOS00121-05
    D. Professional Accreditations: CAP

24. A. Rhode Island Hospital Child Research Center
    B. 1 Hoppin Street
    Providence, RI 02903
    C. Hospital License #: HOS00121-08

25. A. Rhode Island Hospital Outpatient Rehabilitation Services
    B. 1 Hoppin Street
    Providence, RI 02903
    C. Hospital License #: HOS00121-09
    D. Professional Accreditations: JCAHO and CAP

26. A. Hallett Center for Diabetes & Endocrinology
    B. 1 Hoppin Street
    Providence, RI 02903
    C. Hospital License #: HOS00121-10
    D. Professional Accreditations: JCAHO and CAP

27. A. **RIH Pediatric Heart Center**
    B. **1 Hoppin Street**
    Providence, RI 02903
    C. **Hospital License #: HOS00121-11**
    D. **Professional Accreditations: JCAHO and CAP**

28. A. **RIH Pediatric Asthma/Allergy & Specialty Center**
    B. **1 Hoppin Street**
    Providence, RI 02903
    C. **Hospital License #: HOS00121-12**
    D. **Professional Accreditations: JCAHO and CAP**

29. A. **RIH Sleep Disorders Center**
    B. **70 Catamore Boulevard**
    East Providence, RI 02914
    C. **Hospital License #: HOS00121-13**
    D. **Professional Accreditations: JCAHO and CAP**

30. A. **RIH Pediatric and Adolescent Health Care Center**
    B. **1 Hoppin Street**
    Providence, RI 02903
    C. **Hospital License #: HOS00121-14**

25.) Please check each and every category that describes this proposal. Note: If your proposal does not
fit any of these categories, a certificate of need may not be required.
A. ___ construction, development or establishment of a new healthcare facility
B. ___ a capital expenditure for
1. _X_ health care equipment in excess of $1,000,000
2. ___ construction or renovation of a health care facility in excess of $2,000,000
3. ___ an acquisition by or on behalf of a health care facility or HMO by lease or donation
4. ___ acquisition of an existing health care facility, if a notice of intent has not been filed with the state agency, or if the services or the bed capacity of the facility will be changed
C. ___ any capital expenditure which results in an increase in bed capacity of a hospital and inpatient rehabilitation centers (including drug and/or alcohol abuse treatment centers).
D. ___ any capital expenditure which results in an increase in bed capacity of a nursing facility in excess of 10 beds or 10% of facility's licensed bed capacity, which ever is greater.
E. ___ the offering of a new health service with annualized costs in excess of $750,000
F. ___ predevelopment activities not part of a proposal, but which cost in excess of $2,000,000
G. ___ establishment of an additional inpatient premise of an existing inpatient health care facility
H. _X_ tertiary or specialty care services

26.) Does this proposal involve the provision of health services to inpatients? Yes _X_ No____
• If the response to Question 26 is 'Yes', please complete Appendix B

27.) Is the applicant a nursing facility, or does this proposal involve a nursing facility? Yes____ No _X_
• If the response to Question 27 is 'Yes', please complete Appendix C.

28.) Does this proposal involve any construction or renovation? Yes __ No _X_
• If the response to Question 28 is 'Yes', please complete Appendix D.

29.) Does any portion of the capital expenditure for fixed and moveable equipment contained within this proposal comprise the purchase of an individual piece of health care equipment at a cost of $1,000,000 or more? Yes X No ___
• If the response to Question 29 is 'Yes', please complete Appendix E for each such piece of equipment.

30.) On a separate sheet of paper, please discuss the proposal and present the demonstration of the public need for this proposal. Description of the public need must include at least the following elements:

A. Identify the cities and towns that comprise the primary and secondary service area of the facility. Identify the size of the population to be served by this proposal and (if applicable) the projected changes in the size of this population.

See detailed demographics table on page 15.

B. Identify the health needs of this population relative to this proposal.

The health needs of the population relative to this proposal focus on the diagnoses of prostate cancer ; mitral regurgitation and mitral valve prolapse; and gastroesophageal reflux, Barret's esophagus, a premalignant condition, and the need for lifelong pharmacologic therapy, all of which are best and most commonly treated with the surgical interventions of prostatectomy, nissen fundoplication, and minimally invasive mitral valve repair. But the real issue as it relates to health needs is what the most efficacious approach to serving these patients is.

Currently, while each of these surgeries can be done using a robotic approach, there is no local access to a robot in RI. As a result, these surgical procedures are done using conventional approaches, with the majority being open incisions. For those cases that can be done laparoscopically, the robot offers additional visibility and precision of motion that extends the indications and improves the ease of performing advanced minimally invasive surgical procedures using conventional laparoscopic equipment. In the immediate market (MA and RI) there were over 400 men who could have benefited from this less traumatic and more precise surgical approach. As a demonstration of the community's recognition of the value of this service, in Rochester NY, an MSA similar to RI, prostatectomy volumes rose from 63 (9 robotic) in the first year to 272 (257 robotic) by year 4. From the patient and physician point of view this is clearly the preferred modality. The benefits include less blood loss, shorter length of stay, quicker recovery, with equivalent survival and positive margins and a high maintenance of potency.

C. Describe the availability and accessibility of other existing facilities, equipment and services in the state capable of meeting the health needs identified in (B) above for the population identified in (A) above either in whole or in part.

While there are no other existing facilities, equipment or services in the state providing robotic surgical services, conventional surgeries for Prostatectomy and Nissen Fundoplication are provided by all the acute care hospitals in RI except Women and Infants, although some have had very low volume. Landmark, for example had one Prostatectomy case in 2004, and some hospitals have had very low volumes of Nissen Fundoplication surgery. Mitral Valve Surgery is only performed in RI at RIH and The Miriam Hospital (TMH) and, in the Boston Teaching Hospital group comprised by Boston Medical Center, Beth Isarael Deaconess Medical Center, Brigham and Women's, Lahey Clinic, Mass General, New England Medical Center and St. Elizabeth's. The Tables included in the response to Question 30E show the volume and trends by hospital for the last five years. Please note that the volume for the non RI hospitals reflects only the volume

from the geographic area comprised by RI and the 19 Mass towns in the TMH Service Area, while the volume for the RI hospitals is the total volume.

D. Total throughput possible and utilization data (for the past three years and as projected through the next three years after implementation) as a number and a percentage of throughput for each separate area of service affected by this proposal.

See Attachment 3, plus the Table below.

da Vinci S Surgical System	FY2007	FY2008	FY2009
Hours of Operations	3,000	3,000	3,000
Throughput Possible	**587**	**644**	**646**
# of Procedures by Category:			
Prostatectomy	34	90	100
Mitral Valve Repair	8	15	20
Foregut Surgery	8	15	20
Other (Specify):	0	0	0
Total Procedures	**50**	**120**	**140**
Utilization Rate (%)*	**8.5%**	**18.6%**	**21.7%**

Please note that throughput was calculated based on the hours of operation, the average time/case for each type of procedure, and the interval between cases.

In addition, the following table provides a comparison of the time required for each separate type of procedure on a robotic and non-robotic basis. Please note that initial operative times for robotic procedures are longer that conventional open procedures, a differential seen with most conversions of primarily laparoscopic open practices. With experience, the times become equivalent and in some cases the laparoscopic approach is quicker as there is less effort opening and closing the incisions.

Procedure Type	Set-Up Time	Total Robotic Time	Total Non-Robotic Time
Prostatectomy	**20-30 min (1st 10 cases)**	**4 – 6.5 hours**	**2.5 – 4 hours**
	10-15 min (after 1st 10 cases)	**2.5 – 4 hours**	**2.5 – 4 hours**
Mitral Valve Repair	**30-45 min (1st 10 cases)**	**4.5 – 7 hours**	**3 – 4.5 hours**
	15-20 min (after 1st 10 cases)	**3 – 4.5 hours**	**3 – 4.5 hours**
Nissen Fundolication	**20-30 min (1st 10 cases)**	**3– 4 hours**	**1.75 – 2.5 hours**
	10-15 min (after 1st 10 cases)	**2– 3 hours**	**1.75 - 2.5 hours**

E. Identify what portion of the need for the services proposed in this project is not currently being satisfied, and what portion of that unmet need would be satisfied by approval and implementation of this proposal.

In general, the assessment of the future demand and use of the robot for these surgeries assumed that every case now being done on a conventional basis could be a candidate for robotic surgery, but because the community of physicians and patients will take time to adopt

to the new technology, the volume and trends in the market were examined and educated guesses were made about what the likely future volumes would be over time.
Where RI residents sought care and the trends in volume for each procedure were examined, and in the case of prostate cancer disease trends were also examined.

The provision of a minimally invasive surgical option for patients with prostate cancer is the primary objective of the implementation of a Da Vinci Robot at TMH. Both the community need and future utilization were explored using market and cancer registry data. In the market there were a total of 454 surgical cases in 2004, 284 from RI, 134 in the 19 Massachusetts towns surrounding RI, and 36 cases from outside the immediate area. TMH did 51 prostate surgeries per year that would be eligible for a minimally invasive alternative. In 2004, 68 patients from this market sought these surgeries in seven Boston teaching hospitals, and another 18 sought care in Maryland where John Hopkins is known to have an excellent prostate surgical program with a Da Vinci Robot. Five year trends in recent years discussed below, show an 11% increase in volume but declines in the most recent two years for prostate surgery .

The number of prostate cancer patients (based on RI cancer registry data) has declined in recent years, dropping 13.6% from 981 cases in 1999 down to 847 cases in FY2003, with the numbers fluctuating in the interim years. While it is difficult to predict what percentage of patients would seek robotic surgery over conventional surgery in this community, TMH believes that that over time a large percentage will seek the procedure with the shortest average length of stay, recovery period and best urological outcomes. At the University of Rochester, the Da Vinci was instituted in 2001. Total prostatectomy volume grew from 63 (9 robotic) in 2001 to 279 (257 robotic) in 2005.

In addition to those who will seek robotic surgery over conventional surgery, there are also patients who either do not seek treatment (watchful waiting) or who seek brachytherapy who would be inclined to seek robotic surgery instead. According to Intuitive, the da Vinci manufacturer, about 30% of prostate cancer is treated with surgery, 30% with radiation, 20% with watchful waiting, with the remainder treated in combined therapies. A comparison of the age distribution of new cancers to those seeking prostatectomy revealed that while 63% of new cases are on patients over 65, only 35% of the surgeries are on men over 65. As treatment options improve more men may seek surgery.

In projecting use of robotic surgery at TMH no increase in total patients in the market seeking prostate surgery was assumed. Rather the increased volume at TMH was based on changes in care seeking behavior that would be result from the choice of a new surgical treatment option. Since 68 patients in this market seek care in Boston, it was assumed that half of the new cases each year would be from among those who already have decided to seek a non-local source of care, and that the remainder would switch from other local hospitals . TMH treated 51 or 12% of the eligible prostate surgery cases in the market in 2004, and it was assumed the volume would rise by 45 cases in the first full year, 90 in the second, and 100 in the third year, representing market shares of 21%, 31%, and 33%, respectively. TMH assumed that 10, 20 and 25 of these cases in each respective year would be from those cases now leaving the local area. While use could be higher based on experience in other cities, from a financial perspective it was important for the analysis to remain conservative.

There were 98 robotic mitral valve repair surgeries in the market in 2004. Of these 56 where RI residents, 32 were from the Mass 19 towns, and 10 were from outside the immediate area. These surgeries fluctuated over the years studied but there was an upward trend. Twenty open mitral valve repair surgeries occurred at TMH in 2004. Of the 88 cases from RI and the Mass 19 towns, 37 or 43% traveled to a Boston Teaching Hospital for care. TMH expects to draw from these cases because a minimally invasive option will be more attractive with its shorter length

of stay and recovery time, due to the avoidance of sternal splitting and decreased pulmonary complications. TMH is projecting 10 new robot mitral valve cases per year, rising to 15 the second year and 20 by the third year. That is, the hospital expects about half of those who seek care in Boston to come to TMH by the end of the third year. Projected volumes were based on an educated guess concerning patient behavior and physician referral patterns. These estimates are conservative since no growth in volume was assumed even though growth in mitral valve procedures was 21% between 2000 and 2004. With 20 new cases the TMH market share would be 28.5% in a static market; with growth it would 24.5%

Nissen Fundoplication is surgery that is designed to surgically cure gastroesophageal reflux, reducing the incidence of Barret's esophagus a premalignant condition. It also eliminates or significantly reduces the need for lifelong pharmacologic therapy with proton pump inhibitors or H2 blockers. Nissen Fundoplication can be accomplished laparoscopically, however the robot offers additional ease and precision in suture and wrap placement.

There were 138 cases in the market in 2004, down by 36 from 2000 or .21%. TMH performed 8 of these in 2004. Of the 138, 74 were from RI, 52 were from the Mass 19 towns, and 12 were from outside the immediate area . Of the 126 cases from RI and the Mass 19 towns, 38 or 31% of cases were cared for in Boston Teaching Hospitals. Future use of the robot will be highly dependent on patient choice and physician referral patterns as already noted. TMH expects to perform 10 of these surgeries once the robot is in place, rising to 15 in the second year and 20 in the third year. The projected use assumed that in each year half the cases would come from those leaving the local area to go to Boston and the remainder from hospitals in RI. Market share in the third year would as a result be about 25% of the RI and Mass 19 town market .

The Tables on the following pages display the actual volume and year-over year percent change for each of the three types of surgery proposed for the robot from FY'00 through FY'04; and a breakdown of the FY'04 volume by RI, the 19 Mass towns and CT.

Hospitals	Our Market - RI Residents & MA 19 Towns Residents									
PROSTATECTOMY	2000 Volume	2001 Volume	00 - 01 Pct Chg	2002 Volume	01 - 02 Pct Chg	2003 Volume	02 - 03 Pct Chg	2004 Volume	03 - 04 Pct Chg	00 - 04 Pct Chg
Rhode Island Hospitals:										
Rhode Island Hospital	76	76	0%	106	39%	93	-12%	83	-11%	9%
The Miriam Hospital	39	44	13%	57	30%	52	-9%	51	-2%	31%
Newport Hospital	9	8	-11%	11	38%	11	0%	9	-18%	0%
Subtotal Literature	124	128	3%	174	36%	156	-10%	143	-8%	15%
Other RI Hospitals:										
Kent Hospital	25	26	4%	25	-4%	27	8%	27	0%	8%
Landmark Medical Center	6	5	-17%	10	100%	6	-40%	1	-83%	-83%
Memorial Hospital	19	41	116%	36	-12%	28	-22%	27	-4%	42%
Roger Williams Hospital	8	11	38%	12	9%	8	-33%	2	-75%	-75%
South County Hospital	18	12	-33%	15	25%	5	-67%	11	120%	-39%
St. Joseph's Hospital	13	16	23%	16	0%	23	44%	14	-39%	8%
Westerly Hospital	18	5	-72%	7	40%	14	100%	13	-7%	-28%
Women & Infants Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Total RI Hospitals	**231**	**244**	**6%**	**295**	**21%**	**267**	**-9%**	**238**	**-11%**	**3%**
Massachusetts Hospitals										
Boston Teaching Hospital's***	54	76	41%	79	4%	97	23%	86	-11%	59%
Caritas Norwood Hospital	4	6	50%	6	0%	6	0%	5	-17%	25%
Milford-Whitinsville Hospital	3	4	33%	5	25%	1	-80%	13	1200%	333%
Morton Hospital	4	2	-50%	2	0%	2	0%	1	-50%	-75%
Southcoast - "Charlton"	43	45	5%	35	-22%	40	14%	46	15%	7%
Southcoast - "St. Luke's"	34	36	6%	35	-3%	26	-26%	28	8%	-18%
St. Anne's Hospital	8	13	63%	8	-38%	5	-38%	3	-40%	-63%
Sturdy Memorial Hospital	7	19	171%	8	-58%	10	25%	7	-30%	0%
All Other MA Hospitals	17	26	53%	22	-15%	21	-5%	24	14%	41%
Total MA Hospitals	**174**	**227**	**30%**	**200**	**-12%**	**208**	**4%**	**213**	**2%**	**22%**
All Other Hospitals										
CT Hospitals	4	3	-25%	1	-67%	0	-100%	3	0%	-25%
Out-of-State Hospitals	na	na	na	na	na	na	na	na	na	na
Total CT and Other States	**4**	**3**	**-25%**	**1**	**-67%**	**0**	**-100%**	**3**	**0%**	**-25%**
Grand Total	**409**	**474**	**16%**	**496**	**5%**	**475**	**-4%**	**454**	**-4%**	**11%**

The Data excludes discharges from Veteran's, Rehabilitation and Psychiatric hospitals.

* Prostatectomy Procedure Codes: 60.3 (radical), 60.4 (suprapubic), and 60.5 (retropubic)

** The Market includes all of RI and the following 19 Towns from Massachusetts: Attleboro, Bellingham, Blackstone, Dartmouth, Dighton, Douglas, Fall River, Frankliu Millville, New Bedford, North Attleboro, Plainville, Rehoboth, Seekonk, Somerset, Swansea, Uxbridege, Westport, and Wrenthem

*** Boston Teaching Hospitals include: Boston Medical Center, Brigham & Women's, Lahey Clinic, Mass General & NE Medical Center

Hospitals	Our Market - RI Residents & MA 19 Towns Residents									
MITRAL VALVE REPAIR	2000 Volume	2001 Volume	00 - 01 Pct Chg	2002 Volume	01 - 02 Pct Chg	2003 Volume	02 - 03 Pct Chg	2004 Volume	03 - 04 Pct Chg	00 - 04 Pct Chg
Rhode Island Hospitals:										
Rhode Island Hospital	9	5	-44%	15	200%	17	13%	26	53%	189%
The Miriam Hospital	18	15	-17%	27	80%	17	-37%	20	18%	11%
Newport Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Other RI Hospitals:										
Kent Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Landmark Medical Center	0	0	0%	0	0%	0	0%	0	0%	0%
Memorial Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Roger Williams Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
South County Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
St. Joseph's Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Westerly Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Women & Infants Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Total RI Hospitals	**27**	**20**	**-26%**	**42**	**110%**	**34**	**-19%**	**46**	**35%**	**70%**
Massachusetts Hospitals										
Boston Teaching Hospital's***	48	50	4%	40	-20%	36	-10%	45	25%	-6%
Caritas Norwood Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Milford-Whitinsville Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Morton Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Southcoast - "Charlton"	0	0	0%	3	0%	11	267%	5	-55%	0%
Southcoast - "St. Luke's"	0	0	0%	0	0%	0	0%	0	0%	0%
St. Anne's Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Sturdy Memorial Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
All Other MA Hospitals	4	6	50%	7	17%	3	-57%	2	-33%	-50%
Total MA Hospitals	**52**	**56**	**8%**	**50**	**-11%**	**50**	**0%**	**52**	**4%**	**0%**
All Other Hospitals										
CT Hospitals	2	3	50%	0	-100%	0	0%	0	0%	-100%
Out-of-State Hospitals	na	na	na	na	na	na	na	na	na	na
Total CT and Other States	**2**	**3**	**50%**	**0**	**-100%**	**0**	**0%**	**0**	**0%**	**-100%**
Grand Total	**81**	**79**	**-2%**	**92**	**16%**	**84**	**-9%**	**98**	**17%**	**21%**

The Data excludes discharges from Veteran's, Rehabilitation and Psychiatric hospitals.

* Mitral Valve Repair Procedure Codes: 35.12 (open heart valvuloplasty of mitral valve w/o replacement)

** The Market includes all of RI and the following 19 Towns from Massachusetts: Attleboro, Bellingham, Blackstone, Dartmouth, Dighton, Douglas, Fall River, Frankliu Millville, New Bedford, North Attleboro, Plainville, Rehoboth, Seekonk, Somerset, Swansea, Uxbridege, Westport, and Wrenthem

*** Boston Teaching Hospitals include: Boston Medical Center, Brigham & Women's, Lahey Clinic, Mass General & NE Medical Center

Hospitals	Our Market - RI Residents & MA 19 Towns Residents									
NISSEN FUNDOLICATION	2000 Volume	2001 Volume	00 - 01 Pct Chg	2002 Volume	01 - 02 Pct Chg	2003 Volume	02 - 03 Pct Chg	2004 Volume	03 - 04 Pct Chg	00 - 04 Pct Chg
Rhode Island Hospitals:										
Rhode Island Hospital	37	19	-49%	13	-32%	9	-31%	17	89%	-54%
The Miriam Hospital	6	10	67%	6	-40%	12	100%	8	-33%	33%
Newport Hospital	4	7	75%	7	0%	16	129%	4	-75%	0%
Subtotal Hospitals	47	36	-23%	26	-28%	37	42%	29	-22%	-38%
Other RI Hospitals:										
Kent Hospital	14	11	-21%	6	-45%	4	-33%	7	75%	-50%
Landmark Medical Center	0	0	0%	2	0%	2	0%	1	-50%	0%
Memorial Hospital	5	5	0%	3	-40%	2	-33%	4	100%	-20%
Roger Williams Hospital	15	11	-27%	11	0%	6	-45%	8	33%	-47%
South County Hospital	0	1	0%	0	-100%	0	0%	0	0%	0%
St. Joseph's Hospital	14	8	-43%	13	63%	8	-38%	7	-13%	-50%
Westerly Hospital	7	8	14%	7	-13%	3	-57%	7	133%	0%
Women & Infants Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Total RI Hospitals	**102**	**80**	**-22%**	**68**	**-15%**	**62**	**-9%**	**63**	**2%**	**-38%**
Massachusetts Hospitals										
Boston Teaching Hospital's***	27	36	33%	47	31%	32	-32%	40	25%	48%
Caritas Norwood Hospital	4	3	-25%	5	67%	3	-40%	5	67%	25%
Milford-Whitinsville Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Morton Hospital	0	0	0%	0	0%	0	0%	0	0%	0%
Southcoast - "Charlton"	16	17	6%	16	-6%	11	-31%	10	-9%	-38%
Southcoast - "St. Luke's"	8	4	-50%	5	25%	2	-60%	2	0%	-75%
St. Anne's Hospital	5	4	-20%	14	250%	2	-86%	3	50%	-40%
Sturdy Memorial Hospital	7	1	-86%	0	-100%	0	0%	0	0%	-100%
All Other MA Hospitals	5	17	240%	6	-65%	12	100%	13	8%	160%
Total MA Hospitals	**72**	**82**	**14%**	**93**	**13%**	**62**	**-33%**	**73**	**18%**	**1%**
All Other Hospitals										
CT Hospitals	0	0	0%	0	0%	0	0%	2	0%	0%
Out-of-State Hospitals	na	na	na	na	na	na	na	na	na	na
Total CT and Other States	**0**	**0**	**0%**	**0**	**0%**	**0**	**0%**	**2**	**0%**	**0%**
Grand Total	**174**	**162**	**-7%**	**161**	**-1%**	**124**	**-23%**	**138**	**11%**	**-21%**

The Data excludes discharges from Veteran's, Rehabilitation and Psychiatric hospitals.

* Nissen Fundoplication Procedure Codes: 44.66 (Other procedures for the creation of esophagogastric sphincteric competence)

** The Market includes all of RI and the following 19 Towns from Massachusetts: Attleboro, Bellingham, Blackstone, Dartmouth, Dighton, Douglas, Fall River, Frankliu Millville, New Bedford, North Attleboro, Plainville, Rehoboth, Seekonk, Somerset, Swansea, Uxbridege, Westport, and Wrenthem

*** Boston Teaching Hospitals include: Boston Medical Center, Brigham & Women's, Lahey Clinic, Mass General & NE Medical Center

Hospitals	Prostatectomy				Nissen Fundoplication				Mitral Valve Repair			
FY'04 DETAIL	2004 RI Vol	2004 MA Vol	2004 CT Vol	2004 Total	2004 RI Vol	2004 MA Vol	2004 CT Vol	2004 Total	2004 RI Vol	2004 MA Vol	2004 CT Vol	2004 Total
Rhode Island Hospitals:												
Rhode Island Hospital	79	2	2	83	16	1	0	17	25	1	0	26
The Miriam Hospital	46	5	0	51	7	1	0	8	19	1	0	20
Newport Hospital	9	0	0	9	4	0	0	4	0	0	0	0
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other RI Hospitals:												
Kent Hospital	26	1	0	27	7	0	0	7	0	0	0	0
Landmark Medical Center	1	0	0	1	1	0	0	1	0	0	0	0
Memorial Hospital	25	2	0	27	4	0	0	4	0	0	0	0
Roger Williams Hospital	2	0	0	2	7	1	0	8	0	0	0	0
South County Hospital	11	0	0	11	0	0	0	0	0	0	0	0
St. Joseph's Hospital	14	0	0	14	6	1	0	7	0	0	0	0
Westerly Hospital	9	0	4	13	4	0	3	7	0	0	0	0
Women & Infants Hospital	0	0	0	0	0	0	0	0	0	0	0	0
Total RI Hospitals	**222**	**10**	**6**	**238**	**56**	**4**	**3**	**63**	**44**	**2**	**0**	**46**
Massachusetts Hospitals												
Boston Teaching Hospital's***	41	27	18	86	9	29	2	40	12	25	8	45
Caritas Norwood Hospital	0	5	0	5	2	3	0	5	0	0	0	0
Milford-Whitinsville Hospital	0	13	0	13	0	0	0	0	0	0	0	0
Morton Hospital	0	1	0	1	0	0	0	0	0	0	0	0
Southcoast - "Charlton"	11	35	0	46	4	6	0	10	0	5	0	5
Southcoast - "St. Luke's"	0	28	0	28	0	2	0	2	0	0	0	0
St. Anne's Hospital	2	1	0	3	0	3	0	3	0	0	0	0
Sturdy Memorial Hospital	2	5	0	7	0	0	0	0	0	0	0	0
All Other MA Hospitals	3	9	12	24	1	5	7	13	0	0	2	2
Total MA Hospitals	**59**	**124**	**30**	**213**	**16**	**48**	**9**	**73**	**12**	**30**	**10**	**52**
All Other Hospitals												
CT Hospitals	3	0	0	3	2	0	0	2	0	0	0	0
Out-of-State Hospitals	na	na	na	na	na	na	na	na	na	na	na	na
Total CT and Other States	**3**	**0**	**0**	**3**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
Grand Total	**284**	**134**	**36**	**454**	**74**	**52**	**12**	**138**	**56**	**32**	**10**	**98**

The Data excludes discharges from Veteran's, Rehabilitation and Psychiatric hospitals.

*** Prostatectomy Procedure Codes**: 60.3 (radical), 60.4 (suprapubic), and 60.5 (retropubic)

*** Nissen Fundoplication Procedure Codes**: 44.66 (Other procedures for the creation of esophagogastric sphincteric competence)

*** Mitral Valve Repair Procedure Codes**: 35.12 (open heart valvuloplasty of mitral valve w/o replacement)

** The Market includes all of RI, CT & MA from the following 19 Towns: Attleboro, Bellingham, Blackstone, Dartmouth, Dighton, Douglas, Fall River, Frankliu Millville, New Bedford, North Attleboro, Plainville, Rehoboth, Seekonk, Somerset, Swansea, Uxbridege, Westport, and Wrenthem

*** Boston Teaching Hospitals include: Boston Medical Center, Brigham & Women's, Lahey Clinic, Mass General, NE Medical Center, BIDMC, & St. Elizabeth's

F. Identify and evaluate alternative proposals to satisfy the unmet need identified in (E) above.

1. **Implement the Da Vinci S Surgical System - This alternative will provide the residents of Rhode Island with the benefits of state-of-the-art minimally invasive robotic protstatectomy, mitral valve repair and foregut surgical services locally within state. Otherwise, residents of Rhode Island would have to travel to Massachusetts, Connecticut or other states where robotic surgery is available to benefit from it.**

2. **Do Nothing – This alternative will result in the continuation of traditional non-robotic techniques to treat prostate cancer, repair mitral valves and perform foregut surgery for the residents of Rhode Island who choose not to travel out-of-state. Patients with prostate cancer could elect to have an open surgical procedure or take a non surgical approach in the treatment of their prostrate cancer. Although it is possible to perform prostatectomy using conventional laparoscopic techniques, the presence of the pubic bone reduces the angle of instrument manipulation. The urethral bladder anastomosis is extremely difficult with conventional stiff instruments, leading most MIS urologists to use the robot.**

   Mitral valve repair surgery without the use of the Da Vinci system involves delicate reconstruction of native valve tissues or valve replacement in order to restore proper function. This approach requires the surgeon to saw open the breastbone and spread the ribs to gain direct access to the heart. Cutting the sternum and opening the rib cage, the body's natural protective structure for the heart, can prolong healing time and increase the risk of infection, serious complications and even mortality.

   Non-robotic foregut surgery can be accomplished with conventional laparoscopic or open techniques. However, the former requires advanced skills, and the latter a long upper midline incision.

G. Provide a justification for the instant proposal and the scope thereof as opposed to the alternative proposals identified in (F) above.

Alternative 1, the instant proposal, was selected for the following reasons:

1. **The use of the robotic technology in prostate surgery provides for shorter post surgical recovery periods, less blood loss resulting in fewer transfusions, lower risk of infections due to smaller incisions, lower risk of impotence, significantly reduced pain, and lower risk of incontinence compared with the traditional radical prostatectomy. A landmark clinical paper, published by Mani Menon, M.D., Director of the Vattikuti Urology Institute, describes superior potency outcomes after prostate cancer surgery. "The potency outcomes with our robotic surgery are the highest reported to date. Of the patients undergoing the procedure, 97 percent achieved erections strong enough for intercourse - with about half not requiring medication to do so."**

2. **Robotic-assisted minimally invasive cardiac procedures, specifically mitral valve repair, avoids the drawbacks of traditional heart surgery, including blood loss, pain and scarring that typically result from cutting through the breastbone and opening the ribs. For most patients, minimally invasive cardiac procedures performed with the Da Vinci S Surgical System can offer numerous potential benefits over open-chest surgery, including:**
   - **Shorter hospital stay**
   - **Less pain and scarring**
   - **Less risk of infection**

- **Less blood loss and fewer transfusions**
- **Faster recovery**
- **Quicker return to normal activities.**

3. **Finally, robotic assisted foregut surgery, such as Heller myotomy for achalasia reduces the risk of perforation by allowing precise and scaled movement of the myotomy instruments. The robotic technique is also applicable to mobilization of the thoracic esophagus during resection, avoiding thoracotomy or blunt esophagectomy.**

31.) In the case of an application from a hospital, please discuss the potential impact and effectiveness of the proposal in responding to public health emergencies.

None

Census 2000 Population With Projections for 2005, 2010, 2015, 2020, 2025, and 2030*

Primary** & Secondary*** Service Areas for The Miriam Hospital

	Primary Service Area**							Secondary Service Area***						
	2000	2005	2010	2015	2020	2025	2030	2000	2005	2010	2015	2020	2025	2030
Total Population	1,048,319	1,062,472	1,074,201	1,091,821	1,111,446	1,128,239	1,140,554	466,674	473,180	479,686	488,202	496,717	505,200	513,743
Males	503,635	511,560	518,357	527,968	538,174	546,530	552,553	224,547	228,564	232,580	237,052	241,523	245,981	250,470
Females	544,684	550,912	555,844	563,853	573,272	581,709	588,001	242,127	244,617	247,106	251,150	255,194	259,218	263,273
White	891,191	888,519	883,994	881,304	882,315	879,685	871,517	396,726	395,709	394,749	394,070	394,316	393,903	392,560
Non-White	157,128	173,953	190,207	210,517	229,131	248,554	269,037	69,948	77,471	84,937	94,131	102,401	111,297	121,183
Age 00-19	282,616	281,910	272,829	269,609	277,797	285,773	294,900	128,472	125,864	123,256	120,795	118,334	115,928	113,474
Age 20-44	382,449	363,474	351,384	349,795	351,179	356,285	355,312	168,743	161,837	154,931	155,577	156,223	156,843	157,419
Age 45-64	230,852	269,799	299,997	306,608	294,886	273,182	256,657	103,079	118,654	134,228	135,521	136,814	138,195	139,667
Age 65-84	131,505	121,509	121,223	136,586	160,022	186,465	205,508	57,728	57,106	56,484	65,580	74,676	83,616	92,611
Age 85+	20,897	25,780	28,768	29,223	27,562	26,534	28,177	8,652	9,720	10,787	10,729	10,670	10,618	10,573
Disabled (2000)	220,147	223,119	225,582	229,282	233,404	236,930	239,516	84,001	85,172	86,343	87,876	89,409	90,936	92,474
Severe Disabled (2000)	57,658	58,436	59,081	60,050	61,130	62,053	62,730	23,334	23,659	23,984	24,410	24,836	25,260	25,687
Moderate Disabled (2000)	162,489	164,683	166,501	169,232	172,274	174,877	176,786	60,668	61,513	62,359	63,466	64,573	65,676	66,787
Living in Poverty (2000)	117,412	118,997	120,311	122,284	124,482	126,363	127,742	117,412	118,997	120,311	122,284	124,482	126,363	127,742

* Population Projections from RI Statewide Planning Program of the RI Dept. of Admin. No. 154; Aug. 2004 ** PSA includes the State of RI. *** SSA includes 19 MA border towns: Attleboro, Bellingham, Blackstone, Dartmouth, Dighton, Douglas, Fall River, Franklin, Millville, New Bedford (including Acushnet), North Attleboro, Plainville, Rehoboth, Seekonk, Somerset, Swansea, Uxbridge, Westport, Wrentham.

32.) Please identify any recognized health disparities of the population in the applicant's service area and discuss the potential impact of the proposal on reducing and/or eliminating health disparities of the population in the applicant's service area.

While there is no direct impact on the list of health disparities included in the May 2004 Health Rhode Islanders - A Plan For Action report below, this proposal will have an impact on the treatment of prostate cancer in African-American men. Prostate cancer in the African American population presents at an earlier age and at a more advanced stage, in part because of a hesitancy to undergo diagnostic and therapeutic procedures due to concerns regarding impotence. Although this is an issue for all men, there is a greater degree of distrust with this segment of the population. In addition, higher rates of obesity among African-Americans make conventional surgery even more difficult, leading to a higher risk of complications. By providing a minimally invasive approach to this disease with a high assurance of potency, there will be increasing numbers of African-American men who would take advantage of this technology.

Rhode Islanders With The Greatest Health Disparities Within Each Leading Health Indicator

Leading Health Indicator (LHI)	Groups at Most Risk
Physical Activity	**Adults** • Lower levels of education (high school grad/GED or less) • Over the age of 25 • With disabilities • With lower levels of income (less than $35,000) • Hispanic & Black Adults **Adolescents** • Adolescent females • Adolescents in 12th grade • Hispanic Adolescents
Overweight & Obesity	**Adults** • Less than a high school education • Black Adults • With disabilities • Adults ages 45-64 **Adolescents** • Children and adolescents with household incomes below the federal poverty level • Black & Hispanic Adolescents **Fruit and Vegetable Consumption** • With less than a high school education • Adult males • Black Adults
Tobacco Use	**Adults** • Ages 18-44 • Lower incomes (less than $50,000) • Lower levels of education (some college or less) • Living in urban areas **Adolescents** • Adolescents in 12th grad • White Adolescents
Substance Abuse	**Adolescents: Alcohol and Illicit Drugs** • Adolescents in 12th grade **Adolescents: Marijuana** • Adolescents in 12th grade **Binge Drinking** • 18 to 24 year olds • Adult males • More than a high school education

Responsible Sexual Behavior	**Adolescents** • Adolescents in 12th grade **Unmarried Sexually Active Males** • Unmarried sexually active males ages 35-49 • Unmarried sexually active males with incomes less than $25,000 • White unmarried, sexually active males **Unmarried Sexually Active Females** • Unmarried, sexually active females ages 35-44
Mental Health	**Suicide** • Males
Injury & Violence	**Homicide and motor vehicle crashes:** • Males • Blacks **Motor Vehicle Crashes** • 15-24 year olds • 85+ year olds • Blacks
Leading Health Indicator (LHI)	**Groups at Most Risk**
Environmental Quality	**Lead Poisoning** • Black Children
Immunization	**Flu Vaccine** • Living in urban areas • Less than a high school degree • Ages 64-75 **Pneumococcal Vaccine** • Ages 65-74 • Without disabilities
Access To health Care	**Health Insurance Coverage** • Incomes of less than $25,000 • Black Adults • 18 to 24 year olds • Less than a high school degree **Ongoing Source of Care** • Ages 18-24 • Males • Incomes of $25,000 to $34,999 **Adequate Prenatal Care** • Black Women • Asian/Pacific Islander Women • American Indian/Alaskan Native Women • Hispanic Women

From "Health Rhode Islanders - A Baseline Report & A Healthier Rhode Island By 2010 – A Plan For Action", May 2004

33.) If this proposal involves a new health service, discuss whether your facility and other facilities in your service area have documented conditions of overcrowding or excessive waiting times in programs identical or similar to the one proposed herein. Provide all appropriate documentation to substantiate your response.

No new health services are proposed as part of this project.

34.) On a separate sheet of paper, please comment on the efficacy (i.e., the demonstrable effect on health status) of the new institutional health service and/or new health care equipment proposed herein. These comments must include reference to appropriate published reports of epidemiological or clinical

studies as they may pertain to the proposed health service and/or new health care equipment, where applicable.

The medical literature surrounding robotically-assisted minimally invasive surgery is already extensive and covers diverse disciplines as indicated by the list below, from which excerpts are included in Attachment 4. These clinical publications document the pioneering work of many researchers, surgeons and institutions. They attest to the evolution of surgical technique, the pursuit of better patient outcomes and the key role played by the *Da Vinci*® Surgical System.

Prostatectomy:
Ahlering TE, Eichel L, Chou D, Skarecky DW. Feasibility study for robotic radical Prostatectomy cautery-free neurovascular bundle preservation. *Urology*. 2005; 65(5): 994-997. Abstract.

Ahlering TE, Eichel L, Skarecky D. Rapid communication: early potency outcomes with cautery-free neurovascular bundle preservation with robotic laparoscopic radical prostatectomy. *J Endourol.* 2005 Jul-Aug;19(6):715-8. Abstract.
Patel V. Robotic-assisted laparoscopic dismembered pyeloplasty. *Urology* . 2005 Jul;66(1):45-9. Abstract.

Patel VR, Tully AS, Holmes R, Lindsay J. Robotic radical Prostatectomy in the community setting – the learning curve and beyond: initial 200 cases. *Urology.* 2005 July; 174: 269-272. Abstract.

Mitral Valve Repair
Reade CC, Johnson JO, Bolotin G, Freund WL Jr, Jenkins NL, Bower CE, Masroor S, Kypson AP, Nifong LW, Chitwood WR Jr. Combining robotic mitral valve repair and microwave atrial fibrillation ablation: techniques and initial results. Ann Thorac Surg. 2005 Feb;79(2):480-4. Abstract.

Felger JE, Reade CC, Nifong LW, Chitwood WR Jr. Robot-assisted sutureless minimally invasive mitral valve repair. Surg Technol Int. 2004;12:185-7. Abstract.

Kypson AP, Felger JE, Nifong LW, Chitwood WR Jr. Robotics in valvular surgery: 2003 and beyond. Curr Opin Cardiol. 2004 Mar;19(2):128-33. Review. Abstract.

Tatooles AJ, Pappas PS, Gordon PJ, Slaughter MS. Minimally invasive mitral valve repair using the Da Vinci robotic system. Ann Thorac Surg. 2004 Jun;77(6):1978-82; discussion 1982-4. Abstract

Foregut Surgery
Aurora AR. Talamini MA. A comprehensive review of anti-reflux procedures completed by computer-assisted tele-surgery. [Review] [40 refs] [Journal Article. Review] *Minerva Chirurgica. 59(5):417-25, 2004 Oct.*

Hanly EJ. Talamini MA. Robotic abdominal surgery. [Review] [50 refs] [Journal Article. Review] *American Journal of Surgery. 188(4A Suppl):19S-26S, 2004 Oct.*

Talamini MA. Overview--current clinical and preclinical use of robotics for surgery. [Journal Article] *Journal of Gastrointestinal Surgery. 7(4):479-80, 2003 May-Jun.*

Mohr CJ. Nadzam GS. Curet MJ. Totally robotic Roux-en-Y gastric bypass. [Journal Article] *Archives of Surgery. 140(8):779-86, 2005 Aug.*

35.) Please discuss the performance of the applicant regarding provision of uncompensated care, community services or access by minorities and handicapped persons to programs receiving federal financial assistance, including the existence of any civil rights access complaints against the applicant.

In recognition of its community role, The Miriam Hospital has expanded its financial assistance programs to cover all patients who are uninsured, by broadening and further discounting its sliding fee scales, which are based on a formula related to Medicaid reimbursement, providing relief to those uninsured patients who are not eligible for free care. The guidelines for free care are set at 200% of the Federal Poverty Guidelines, adjusted annually in March. For the fiscal year ended September 30, 2005, 92.3% of the patients eligible for free care received a 100% write-off, 4.1% a 90% write-off, 1.4% a 75% write-off, and 1.2% a write-off between 10% and 60%.

The hospital maintains records to identify and monitor the level of charity care it provides, including the amount of charges forgone for services and supplies furnished under its charity care policy and the estimated cost for those services and supplies. For fiscal year 2005, The Miriam Hospital recorded $12.4M in charges forgone based on established rates, with the estimated cost for this charity care being $3.5M. In addition, $19.5M in uncollectible patient accounts was recorded in fiscal year 2005, based on charges net of contractual allowances, at an estimated cost for the provision of services of $5.4M. There have been no civil rights complaints filed against the hospital due to either physical or financial access issues.

Revenues from Medicare and Managed Medicare programs accounted for 49.5% of the hospital's gross patient service revenue for the fiscal year 2005, with Medicaid programs including the State's Rite Care program accounting for 6.8% and the uninsured population accounting for 3.4% of the hospital's gross patient service revenue for the fiscal year 2005.

36.) Please discuss actions taken by this facility in the past to remove transportation, design, and financial barriers that limit access to the facility.

Actions taken by TMH to remove transportation barriers to access to the hospital include valet parking services for all patients at the front door of the hospital, and shuttle service for employees from and to satellite parking lots so that on-campus parking can be utilized by patients. In addition, TMH has continued to make strides in making the hospital financially accessible. It is the hospital's policy (a function of its mission) to provide access to medically necessary services to all patients regardless of their ability to pay. TMH presents a 'Charity Care' application to all uninsured patients and assistance is given in completing the forms. The hospital also has assisted patients in filling out Rite Care applications on site and worked closely with DHS on follow up.

37.) Please discuss the extent to which low income persons, racial and ethnic minorities, women, handicapped persons, and the elderly presently have access to such services and the extent to which such groups are likely to have access to this service

As stated in the response to Question 35 above, The Miriam Hospital has expanded its financial assistance programs to cover all patients who are uninsured, by broadening and further discounting its sliding fee scales, which are based on a formula related to Medicaid reimbursement, providing relief to those uninsured patients who are not eligible for free care. In addition, consistent with its Mission, The Miriam Hospital is committed to assuring patients with the ability to pay will be considered carefully when seeking payment for health services that have been delivered, which the programs discussed above do by balancing needed financial assistance with the hospital's long-term goals of serving its communities.

As stated in the response to Question 36 above, it is The Miriam Hospital's policy to provide access to medically necessary services to all patients regardless of their ability to pay. The hospital has a 'Charity Care' form that is presented to uninsured patients and assistance is

given in completing the forms. The hospital also assists people in filling out Rite Care and Medicaid applications on site and works closely with DHS on follow up.

38.) In cases where a reduction, termination, interruption, or relocation of a service is contemplated, please discuss plans for accommodating the needs of the population, including low-income persons, racial and ethnic minorities, women, handicapped persons and the elderly.

Not Applicable

39.) Please discuss the extent to which Title XVIII (Medicare), Title XIX (Medicaid) and medically indigent patients are served by the applicant.

As stated in the responses to Questions 35 and 37 above, The Miriam Hospital has expanded its current financial assistance programs to all patients who are uninsured by broadening and further discounting its sliding fee scales, which are based on a formula related to Medicaid reimbursement, providing relief to those uninsured patients who are not eligible for free care. In addition, consistent with its Mission, The Miriam Hospital is committed to assuring patients that ability to pay will be considered carefully when seeking payment for health services that have been delivered, which the programs discussed above do by balancing needed financial assistance with the hospital's long-term goals of serving its communities.

Revenues from Medicare and Managed Medicare programs accounted for 49.5% of the hospital's gross patient service revenue for the fiscal year 2005, with Medicaid programs including the State's Rite Care program accounting for 6.8% and the uninsured population accounting for 3.4% of the hospital's gross patient service revenue for the fiscal year 2005.

As stated in the response to Question 36 above, it is also The Miriam Hospital's policy (a function of its mission) to provide access to medically necessary services to all patients regardless of their ability to pay. The hospital has a 'Charity Care' application that is presented to all uninsured patients and assistance is given in completing the forms. The hospital also has assisted people in filling out Rite Care applications on site and worked closely with DHS on follow up.

Also see response to Question 64 in Attachment 3.

40.) Please discuss the extent to which the applicant offers a range of means by which a person will have access to its services (e.g., outpatient services, admission by house staff, admission by personal physician).

TMH offers a range of means by which patients have access to the hospital and its services:

1. **Through the Emergency Department**
2. **As a direct admission which encompasses transfers from other facilities, from a physician office, from home, or from a procedural area scheduled for admission post procedure such as in cardiac cath lab, interventional radiology or same day surgery.**
3. **Through prostate screening outreach clinics in underserved communities.**

41.) A) Please itemize the capital costs of this proposal. Present all amounts in thousands (e.g., $112,527=$113). If the proposal is going to be implemented in phases, identify capital costs by each phase.

See Attachment 3

B.) Given the above projection of the total capital expenditure of the proposal, please provide an analysis of this proposed cost. This analysis must address the following considerations:

1. The financial plan for acquiring the necessary funds for all capital and operating expenses and income associated with the full implementation of this proposal, for the period of 6 months prior to, during and for three (3) years after this proposal is fully implemented, assuming approval.

See Attachment 3

2. The relationship of the cost of this proposal to the total value of your facility's physical plant, equipment and health care services for capital and operating costs.

3. A forecast for inflation of the estimated total capital cost of the proposal for the time period between initial submission of the application and full implementation of the proposal, assuming approval, including an assessment of how such inflation would impact the implementation of this proposal.

42.) Please indicate the financing mix for the capital cost of this proposal. **NOTE:** the Health Services Council's policy requires a minimum 20 percent equity investment in CON projects (33 percent equity minimum for equipment-related proposals).

See Attachment 3

43.) Please identify the specific source(s) and evidence of commitment of equity identified in the response to Question 42.

The existing source of equity for this project is unrestricted cash.

44.) Will a fundraising drive be conducted to help finance this approval? Yes ___ No **X**

45.) Will a feasibility study be conducted of fundraising potential? Yes___ No **X**
• If the response to Question 45 is 'Yes', please provide a copy of the feasibility study.

46.) Will the applicant apply for state and/or federal capital funding? Yes___ No **X**
• If the response to Question 46 is 'Yes', please provide the source: _____,
amount: _____, and the expected date of receipt of those monies: _____.

47.) Please calculate the yearly amount of depreciation and amortization to be expensed.

See Attachment 3

48.) For the first full operating year of the proposal (identified in Question 49 below), please identify the total number of FTEs (full time equivalents) and the associated payroll expense (including fringe benefits) required to staff this proposal. Please follow all instructions and present the payroll in thousands (e.g., $42,575=$43). Please describe the plan for the recruitment and training of personnel (if applicable).

See Attachment 3.

In addition, two Surgeons and two Nurses are required to operate the Da Vinci S Surgical System, one surgeon at the operating console, one surgeon to assist at the bedside, a scrub nurse and a circulating nurse.

TMH will train current personnel to provide technical support for the Da Vinci S Surgical System. In addition, surgeons are being recruited to provide this service, some of whom will join private practices and be supported within the groups, with other surgeons being employed directly by the hospital or affiliated foundations.

The standards and practices relative to certification, credentialing, quality and training are as follows:

1. **Must be Board Certified or Board eligible within their surgical specialty (there are no specific certification requirements for robotic surgery at the present time);**
2. **Must be credentialed in laparoscopic or thoracic surgery for the procedure to be performed;**
3. **Show evidence of attendance at a hands-on da Vinci training program of at least 16 hours duration;**
4. **Must have at least 3 hours of personal time on the da Vinci utilizing animate or cadaver models;**
5. **Show evidence of observing at least 2 clinical cases utilizing the da Vinci;**
6. **Show evidence of 4 proctored patient uses of the da Vinci;**
7. **Provisional status will be changed to full privileges after four successful da Vinci cases and upon approval of the Director of Robotic Surgery;**
8. **Full privileges will be re-evaluated upon a formal review of the first 25 cases (Note that the standard learning curve is considered to be 10 cases, as reflected in the Tables included in the response to Questions #30D);**
9. **Outcomes to be monitored include length of stay, blood loss, complications, operating room time, and conversion to laparoscopic or open procedure;**
10. **Trained surgeons will be required to first assist in robotic procedures under the direct supervision of an experienced surgeon, and complete the required number of hours of training before using the robot independently in an actual surgical case.**
11. **As part of the purchase agreement with Intuitive Surgical, Inc., Intuitive shall provide training for two surgeons and two support staff.**

In addition, since there are no Standard of Practice Guidelines for robotic surgery at this time, TMH will adopt guidelines published by surgical societies as a Standard of Practice Guidelines once the publications become available.

49.) Please complete the following pro-forma income statement for each unit of service. Present all dollar amounts in thousands (e.g., $112,527=$113). Be certain that the information is accurate and supported by other tables in this worksheet (i.e., "depreciation" from Question 47 above, "payroll" from Question 48 above). If this proposal involved more than two separate "units of service" (e.g., pt. days, CT scans, outpatient visits, etc.), insert additional units as required.

See Attachment 3. In addition, the Table below provides detailed cost and reimbursement data such for each category of procedure (prostatectomy, mitral valve repair, foregut and other) for the da Vinci unit compared to the non-robotic techniques, to support the statement included in the response to Question #3 that the proposed equipment will result in 'lower cost'.

	Prostatectomy	Mitral	Foregut	Weighted Average*
Avg. Cost/Case - Robotic	$7,276	$26,132	$9,811	$10,243
Avg. Cost/Case – Non-Robotic	$10,966	$37,710	$9,811	$14,515
Difference/Case	($3,690)	($11,578)	$0	($4,272)
Avg. Reimbursement / Case - Robotic	$4,604	$16,712	$8,755	$6,859
Avg. Reimbursement / Case - Non-robotic	$10,932	$34,113	$8,755	$13,845
Difference/Case	($6,328)	($17,401)	$0	($6,986)
Avg. Reimbursement less Cost/Case - Robotic	($2,672)	($9,420)	($1,056)	($3,384)
Avg. Reimbursement less Cost/Case – Non-Robotic	$(34)	($3,597)	($1,056)	($670)
Difference/Case	$(2,638)	($5,823)	$0	($2,714)

*** Based on weighting of total projected cases by type, FY'07 through FY'09**

50.) Provide an analysis and description of the impact of the proposed new institutional health service or new health equipment, if approved, on the charges and anticipated reimbursements in any and all affected areas of the facility. Include in this analysis consideration of such impacts on individual units of service and on an aggregate basis by individual class of payer. Such description should include, at a minimum, the projected charge and reimbursement information requested above for the first full year after implementation, by payor source, and shall present alternate projections assuming (a) the proposal is not approved, and (b) the proposal is approved. If no additional (incremental) utilization is projected, please indicate this and complete this table reflecting the total utilization of the facility in the first full fiscal year.

See Attachment 3

51.) Please provide the following financial information:

A. The total amount of debt currently held by the applicant, broken down into short term debt (debt which will be fully repaid within one year of the date of the filing of this application), and long term debt (debt which will take longer than one year to repay), exclusive of any debt associated with the financing of this proposal.

See Attachment 3

B. The terms and conditions of any agreements entered into by the Applicant and any lender (such as conditions that may be entered into under bond covenants or bank loans) prior to the filing of this application, which may deter the applicant from obtaining any additional debt.

None

C. Audited financial statements for the previous fiscal year and unaudited financial statements for the current fiscal year-to-date.

See Attachment 5

D. Please complete the folowing table for the previous three fiscal years and year to date:

See Attachment 3

E. Please discuss the impact of approval or denial of the proposal on the future viability of the applicant and of the providers of health services to a significant proportion of the population served or proposed to be served by the applicant.

This project is directly related to hospital's focus on developing state-of-the-art surgical services for the population that we serve. The construction of 10 new surgical suites is underway as approved by the Department in previously approved CON's, and is an important step towards this goal. However, as important is the development of the surgical staff to include individuals with state-of-the-art expertise in the area of minimally invasive surgery. This approach to surgery has generally been increasing since its initial introduction years ago with laproscopic cholesystecomy. Time has proven the positive impact of minimally invasive techniques in terms of both patient outcome and cost. The continued evolution of this field has now moved to the use of the Da Vinci robotically assisted device. All but four states in the country currently have this technology in place. Given its national adoption and superior outcomes, many young surgeons are interested in working in a surgical environment which offers this important tool. In our efforts to recruit minimally invasive urological surgeons to move to Rhode Island and establish new practices it has been clear that the Da Vinci system is a critical component to their decision. Therefore, without approval of this CON, attracting surgical talent will be more difficult and the hospital's goal of establishing state-of-the-art surgical services with a particular emphasis on minimally invasive surgery will not be achieved, denying the residents of Rhode Island access to this superior surgical treatment approach.

52.) A) If the applicant is an existing facility:

Please identify and describe any outstanding cited health care facility licensure or certification deficiencies, citations or accreditation problems as may have been cited by appropriate authority. Please describe when and in what manner this licensure deficiency, citation or accreditation problem will be corrected.

There are no outstanding health care facility licensure or certification deficiencies, citations or accreditation problems cited by appropriate authorities that the hospital is aware of.

B) If the applicant is a proposed new health care facility:

Please describe the quality assurance programs and/or activities which will relate to this proposal including both inter and intra-facility programs and/or activities and patient health outcomes analysis whether mandated by state or federal government or voluntarily assumed. In the absence of such programs and/or activities, please provide a full explanation of the reasons for such absence.

Not Applicable

C) If this proposal involves construction or renovation:

Please describe your facility's plan for any temporary move of a facility or service necessitated by the proposed construction or renovation. Please describe your plans for ensuring, to the extent possible, continuation of services while the construction and renovation take place. Please include in this description your facility's plan for ensuring that patients will be protected from the noise, dust, etc. of construction.

Not Applicable

53.) Please identify what other areas of service, if any, would be likely to require development at some time as a direct result of this proposal? Please specify what consequent capital, operating and equipment costs might be expected related to the other areas of service, the date of the additional project undertaking and the date of the additional project completion.

None

54.) Please complete the following table by identifying all the Certificate of Need and Change Order Requests granted to the applicant for the last five years:

Year Approved	Project Description	Capital Cost of the Project ($M)	Debt Financing ($M)	Equity Financing ($M)	Start Date*	Date of Completion*
2002(and appeals in 2003 & 2004)	**Surgical Services Upgrade**	**$25.2M**	**$0**	**$25.2**	**4/05(A)**	**9/07(P)**
2004	**Cardiac Care/ University Medical Centers**	**$6.4M**	**$0**	**$0.6 $5.8 Lease**	**3/03(A)**	**9/04(A)**
2004	**Radiology and Support Services Upgrade**	**$9.2M**	**$0**	**$9.2M**	**4/05(A)**	**9/07(P)**
2004	**Bed Upgrade**	**$51.6M**	**$0**	**$51.6M**	**4/05(A)**	**9/10(P)**
	TOTAL	**$92.4**	**$0**	**$86.6 $5.8 Lease**		

* Please identify whether each date is actual or proposed.

55.) Please discuss the relationship of the proposal to any long-range capital improvement plan of the applicant.

The Da Vinci system will be utilized in the main operating rooms being relocated to the new Patient Services Building currently under construction as part of the hospital's building plans previously approved by the Department

56.) If this facility admits inpatients, please discuss the extent to which the physicians privileged to admit patients to this facility have offices in designated poverty areas or practice at neighborhood health centers.

Sixty-two percent of medical staff members at The Miriam Hospital have primary office locations in the Providence area providing access to a full range of clinical care services to patients including those in poverty areas. Included in these clinical care services are specialties and subspecialties including medicine, surgery, psychiatry, dentistry, gynecology, orthopedics,

radiology and emergency medicine. All services at The Miriam Hospital are available to all patients regardless of their ability to pay.

57.) Please discuss the impact of the proposal on the community to be served and the people of the neighborhoods close to the health care facility who are impacted by the proposal.

In addition to the significant benefits provided to the patients of the community served being treated by the use of robotically assisted minimally invasive surgery as stated in the responses to questions 30F and 30G, the community also benefits as a whole from the shorter recuperation periods allowing patients to return home and to work sooner than with alternate surgical techniques.

The immediate neighborhood surrounding the hospital will not be directly impacted by this proposal since the equipment is mobile and is used within the operating room environment. This proposal does not involve any construction so there will be no noise or environmental impacts associated with its' implementation. In addition, the volume of patients treated with the Da Vinci system will not materially impact neighborhood traffic as the institution remains limited in terms of overall volume by its bed and operating room capacity.

58.) Please discuss the impact of the proposal on the quality of health care in the state and in the population area to be served by the applicant.

Refer to the responses to Questions 30F, 30G, 51E and 57.

59.) Please discuss the relationship of this proposal to any state health plans that may have been formulated by the state agency and are relevant to the proposal.

Not Applicable

60.) Please discuss the relationship of the services proposed to be provided to the existing health care system of the state

See responses to Questions 30, 57 and 58.

61.) Please identify the derivable operating efficiencies, if any, (i.e., economies of scale or substitution of capital for personnel) which may result in lower total or unit costs as a result of this proposal.

While there are no derivable operating efficiencies expected as a result of this proposal in terms of economies of scale or the substitution of capital for personnel, reductions in length of stay of anywhere from 2 to 3 days on average are expected as a result of using the minimally invasive Da Vinci S Surgical System resulting from reduced blood bank services and overall costs per patient. An average length of stay drop of one day stay for a surgical patient is valued at about $1,614 at TMH. The introduction the robot is expected to result in 310 new robotic surgeries at TMH during the first three years of operation, FY'07 through FY'09, a savings of between 620 and 930 patient days or approximately $1M to $1.5M across these patients.

In addition a large percentage of patients will be diverted from Boston Teaching Hospitals which are more expensive . A case-mix adjusted benchmarking study performed by Lifespan which used Healthshare data identified that TMH was the second least expensive teaching hospital in the region when all COTH members in RI and Boston were compared to each other. The median for the group of 11 hospitals was $12,476 while TMH was $10,132 per stay in 2004 As a result, payers will pay less when surgical care is provided at TMH rather than Boston Teaching Hospitals.

62.) Please discuss the efficiency and appropriateness of the proposed new institutional health services, including the extent to which the proposed new service or equipment, if implemented, will not result in any unnecessary duplication of existing services or equipment.

This proposal represents a new approach to minimally invasive surgery and an alternative to open surgery. There is no duplication of any existing service or equipment. Rather, a new robotic technology is being introduced that will be used in place of conventional open surgery for those protstatectomy, mitral valve repair and foregut surgical cases that come to TMH and qualify for the new robotic technology. The efficiencies and appropriateness expected from this new approach are reductions in length of stay and blood bank services costs as discussed in the response to Question #61 above, and, access and availability of this new technology locally in RI.

63.) Please comment on the affordability of the proposal at the time, place and under the circumstances proposed, considering, as applicable, the definition of affordability provided in the Rules and Regulations for Determination of Need for New Health Care Equipment and New Institutional Health Services (R23- 15-CON, Section 3.26) as follows: "**Affordability**" means the relative ability of the people of the state to pay for or incur the cost of a proposal, given:

A. consideration of the state's economy;

The State of Rhode Island FY'06 Budget Executive Summary noted the following conclusion from the section on the state's economy: "The State's economy was the only economy in southern New England that did not experience a decrease in employment on a year-over-year basis through November in CY 2002 through CY 2004. The drag of the Massachusetts and Connecticut economies was reflected in Rhode Island having the lowest growth rate in personal income in all of New England for the period of the fourth quarter of 2003 through the third quarter of 2004 versus the same period in the prior years. Even though growth in personal income was slower than elsewhere in the region, it advanced at a strong 4.79 percent clip. The end result is a Rhode Island economy that is poised for stronger employment and personal income growth in the FY 2005 through FY 2007 period. An outcome that bodes well for the State's residents."
More recent publications related to the state's economy indicate that the economy in Rhode Island may not be as robust as forecasted in 2005, but would still continue to grow, such as a May 11 article in the Providence Journal with Edward Mazze,

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Over the next several years, job growth is expected to decline and housing prices will level off, according to the New England Economic Partnership. * * *This may be as good as Rhode Island's economy gets - at least for a while. Job growth is forecast to slow during the next few years, and house prices to level off, then gradually decline, according a forecast to be released today by the New England Economic Partnership.

Nationally, energy prices have spiked, housing prices are leveling off and more and more service jobs are being outsourced to companies abroad. Those global trends, coupled with Rhode Island's budget deficit, high housing prices, noncompetitive tax rates and the inability to attract enough high-paying jobs, among others, are why the state will find it harder in coming years to compete, said Rhode Island's NEEP forecaster, Edward M. Mazze. "How do you hide the fact that one-third of the license plates in Rhode Island are Florida?" he said. "Does that tell you something?" Mazze is the dean and the Alfred J. Verrecchia-Hasbro Inc. Leadership Chair of the University of Rhode Island's College of Business Administration. In an interview, he shared his views about the challenges facing Rhode Island and about the forecast he will

present at NEEP's spring conference today in Westborough, Mass. The forecast for the region as a whole, and for the other New England states, will be released later today.

Rhode Island, which has experienced among the biggest run-ups in house prices of any state in the nation, is about to see those prices decline -- though not sharply, Mazze said.
The forecast is for the median price of a single-family house in the state to peak this year, at $289,300, and then fall to just under $282,000 by 2008. The forecast is for house prices to continue to decline through 2010. If the prediction holds true, however, the declines won't come close to erasing the gains. That's because the median price of a house from 2003 through 2006 will have appreciated nearly 26 percent, according to the forecast. And during the next four years, the NEEP predicts, the median prices will decline about 5 percent.

Meanwhile, jobs are forecast to continue to grow - but at a lot slower rate. Job growth is expected to peak this year, with 6,800 new jobs, a growth rate of 1.4 percent. Jobs are forecast to grow at half that rate next year, and continue to taper off in 2008. In 2009 and 2010, the forecast is for a job growth rate of just under 1 percent. If the forecast is accurate, Rhode Island will have gained about 19,300 jobs during the last four years, a growth rate of just under 4 percent. That is just shy of Governor Carcieri's promise to create 20,000 new jobs by the end of his four-year term.

Another measure of the Rhode Island economy, gross state product, or GSP, is forecast to slow next year to a growth rate of 1.6 percent, the lowest since 2002. In 2005, the rate was 3 percent. The reason for the decline, Mazze wrote in his forecast, is the movement of businesses to other regions of the country, which will result in more job losses.

"The forecast can change dramatically," he stated, "if the state attracts a major business in the second half of 2006."

As for the 400-plus luxury condos going up in downtown Providence, Mazze is skeptical. "I don't believe they're going to be able to fill them," he said. "You're going to have all of these condos in a city where most of the professional service firms of any size are no longer headquartered here. What's going to happen is there are going to be a lot of empty condos!

However, the major consideration the applicant took into account in assessing the affordability of this proposal and the resultant impact upon the state's health care system and economy, and the residents of Rhode Island, was its ability to bear the projected cost. With this in mind, the applicant has decided to fund this project with 100% equity as stated in the response to question 42, so that if approved, this project will not place any additional interest expense upon the state's health care system nor pass any additional expense on to the residents of Rhode Island associated with financing costs, thereby minimizing any potential economic impact on the state's health care system and residents of Rhode Island.

Finally, TMH believes the projected incremental annual operating expense for this project of $893,000 will occur even if this project is not approved, based on the projected demand for the type of surgery the Da Vinci S Surgical System is intended to be used for. However, without the benefits generally associated with robotic surgery of shorter post surgical recovery periods; less blood loss; fewer transfusions; lower risk of infections, impotence and incontinence; significantly reduced pain; shorter hospital stays; and faster recovery and quicker return to normal activities, the cost to perform these surgeries would most likely exceed $893,000 and therefore place a greater cost burden upon the health care system of the state.

B. consideration of the statements of authorities and/or parties affected by such proposals;

See the response to Q63A above.

C. economic, financial, and/or budgetary constraints of parties affected by such proposals, including cost impact statements submitted by the State Medicaid Agency or State Budget Officer;

This proposal has the support TMH Board of Trustees to invest the capital and operating expense necessary to implement this project.

64.) Please complete the following tables with data from the previous fiscal year.

See Attachment 3

65.) Please identify and describe any existing or proposed programs for achieving continuity of patient care as it may pertain to this proposal. Please specifically address the following:

None

A. Any existing or proposed programs for service linkages with other health care facilities or providers pertaining to the proposed new institutional health service. Please include in the description an identification of the other health care facilities with whom linkages are proposed and a description of the type of linkages sought.

B. The relationship of this proposal to other programs and services (current or proposed) at your facility and how the instant proposal will enhance the continuity of care at your facility.

66.) Please identify any arrangements between the applicant and any medical schools and/or academic medical centers and describe the relationship of the proposal to such entities.

There is no specific educational component to this proposal. However, TMH is a major teaching affiliate of The Brown University Medical School and as such offers its fellows, residents and medical students access to all units of the hospital for educational purposes. Robotic technology is a vital component in the growing field of minimally invasive surgery. It is our obligation to provide the next generation of surgeons the skills required to deliver the highest quality of care to their patients which cannot be accomplished without investment in this technology. In addition, failure to provide these educational opportunities will make our residency programs less attractive to the top students. Further, Residents from RIH will be able to have robotic surgery integrated into their surgical training program and learn these techniques.

67.) Please describe on a separate sheet of paper all energy considerations incorporated in this proposal.

None

68.) Please comment on any other factors, which the applicant thinks should be considered prior to a decision by the state agency.

TMH believes it has demonstrated that this project will benefit residents of Rhode Island requiring prostatectomy, mitral valve repair, thoracotomy or blunt esophagectomy surgical procedures, by providing:

- **A less invasive form of robotic surgery locally eliminating the need for patients to either travel out-of-state, or continue to have traditional more invasive surgery performed locally;**
- **Shorter post surgical recovery periods;**
- **Less blood loss;**
- **Fewer transfusions;**
- **Lower risk of infections, impotence and incontinence;**
- **Significantly reduced pain and scarring;**
- **Shorter hospital stays;**
- **Reduced risk of perforation; and**
- **Lower costs to the health care system in Rhode Island than would otherwise incur.**

Therefore, TMH strongly encourages the Department to approve this proposal.

1

ATTACHMENT 1

LIFESPAN CORPORATION BOARD OF DIRECTORS

Name	Address	Other Healthcare Interests	Business Interest with Lifespan
Mr. Jeffrey Brier	**O:** Brier & Brier, One Richmond Square, Providence RI, 02903 **Telephone:** (401) 751-2990 **Fax:** (401) 351-8347 **H:** 4 Harian Road, Providence RI, 02906	Chair, The Miriam Hospital	None
Mr. David A. Brown	**O:** President, Whittet-Higgins Co., P.O. Box 1208, Providence RI, 02901 **Telephone:** (401) 728-0700 **Fax:** (401) 728-0703 **H:** 15 Bond Road, Riverside, RI 02915	Chair, Emma Pendleton Bradley Hospital	None
Mr. Peter Capodilupo	**O:** Autocenter Enterprises Inc., 285 East Main Road, Middletown RI, 02842 **Telephone:** (401) 846-6640 **Fax:** (401) 842-0434 **H:** 1 Avenir Court, Bristol RI, 02809	None	None
George D. Caruolo, Esq.	**O:** Attorney at Law, 670 Willett Avenue, East Providence, RI 02915 **Telephone:** (401) 437-0905 **Fax:** (401) 437-3618 **H:** 1 Goodall Place, Riverside RI, 02915	None	Compensated Consultant on Government Relations
David F. Cunningham, M.D.	**O:** Coastal Medical, 850 Aquidneck Avenue, Middletown RI, 02842 **Telephone:** (401) 846-0055 **Fax:** (401) 842-0963 **H:** 118 Wyndham Hill Road, Middletown RI, 02842	Shareholder in Coastal Medical which has a contract with laboratory. Coastal may compete with Lifespan PSO on certain matters	None
Michael Ehrlich, M.D.	**O:** Surgeon-in-Chief, Dept. of Orthopaedics, 2 Dudley Street, 1st floor - Room 170.36, Providence RI, 02903 **Telephone:** (401) 444-5895 **Fax:** (401) 444-6243 **H:** 112 Sudbury Road, Concord MA, 01742	President, University Orthopae-dics	Compensated as Rhode Island Hospital Chief of Orthopaedics for admini-strative, service, and teaching services

Name	Address	Other Healthcare Interests	Business Interest with Lifespan
Mr. Barnet Fain	**O:** BWB Realty, 1 Park Row, Providence RI, 02903 **Telephone:** (401) 272-5030 **Fax:** (401) 272-9040 **H:** 71 Adams Point Road, Barrington RI, 02806	None	None
Ms. Armeather Gibbs	**O:** United Way of RI, 229 Waterman Street, Providence RI, 02906 **Telephone:** (401) 444-0613 **Fax:** (401) 444-0635 **H:** 4 Arbor Drive, Providence RI, 02908	None	None
Mr. William H.D. Goddard (Vice Chair)	**O:** Operating Manager & CEO, Brown & Ives Land Co., LLC, 50 South Main Street, Providence RI, 02903 **Telephone:** (401) 421-7382 **Fax:** (401) 331-3100 **H:** 5 Brown Street, Providence RI, 02906	None	None
Edward Iannuccilli, M.D.	**H:** 70 High Street, Bristol RI, 02809	Chair, Rhode Island Hospital; consultant to Coastal Medical	None
V. Duncan Johnson, Esq.	**O:** Edwards & Angell, LLP, 2800 Financial Plaza, Providence RI, 02903 **Telephone:** (401) 276-6478 **Fax:** (401) 276-6611 **H:** 102 Williams Street, Providence RI, 02906	None	Partner in Edwards & Angell, LLP; the law firm provides services to Lifespan and its affiliates
Mr. Scott B. Laurans	**O:** Managing Director, Mellon, 200 Turks Head Place, Providence RI, 02903 **Telephone:** (401) 331-6250 **Fax:** (401) 331-7014 **H:** 35 Barberry Hill, Providence RI, 02906	None	None
Charles J. McDonald, M.D.	**O:** Dermatologist in Chief, RI Hospital -APC 10, 593 Eddy Street, Providence RI, 02903 **Telephone:** (401) 444-7137 **Fax:** (401) 444-7105 **H:** 433 Poppasquash Road, Bristol RI, 02809	President, Dermatology Foundation of RI, Inc.	Compensated as Rhode Island Hospital Chief of Dermatology for administrative, service, and teaching services

Name	Address	Other Healthcare Interests	Business Interest with Lifespan
The Honoraable Bruce M. Selya	**O:** United States Circuit Judge, 316 Federal Building, 1 Exchange Terrace, Providence RI, 02903 **Telephone:** (401) 752-7140 **Fax:** (401) 752-7150 **H:** 224 George Street, Providence RI, 02906	None	None
George Vecchione President and CEO Lifespan Corporation	**O:** Lifespan Corporation, CORO Building, 167 Point Street **Providence, RI 02903** **Telephone:** 401-444-6699 **Fax:** 401-444-8700 **e-mail:** gvecchione@lifespan.org	None	President and CEO
Alfred J. Verrecchia Chairman of the Board	**O:** Hasbro, Inc., 1011 Newport Avenue, Pawtucket, RI 02860 **Telephone:** 401-727-5100 **Fax:** 401-721-7202 **e-mail:** averrecchia@hasbro.com	None	None

THE MIRIAM HOSPITAL
BOARD OF TRUSTEES - 2006

Name	Address	Healthcare Interests	Business Interest with Lifespan
Peter Arden President and CEO The Arden Corporation 60 Taylor Drive Rumford, RI 02916 Real Estate	*Phone:* (401) 434-2500 *Fax:* (401) 434-3609 *E-mail:* petarden@aol.com	Lifespan Finance Committee; Lifespan Property & Facilities Committee; TMH Board of Trustees; TMH Finance Committee; TMH Professional and Academic Affairs Committee; TMH Construction Committee TMH/RIH Joint Finance (obligated bond group) Committee	None
Robert L. Bahr, MD R.I. Eye Institute 150 East Manning Street Providence, RI 02906 Doctor	*Phone:* (401) 272-2020 *Fax:* (401) 421-5979 *E-Mail:* robert_bahr@brown.edu	TMH Board of Trustees; Miriam Hospital IPA Board; Lifespan PSO Board; New England Medical Physician Alliance Board; medical practice owns less than 2% ownership of Same Day SurgiClinic, Fall River, MA; practice is also a 13.9% stockholder in the East Bay Surgicenter, an ophthalmic surgicenter in Swansea (not an officer or director of either entity); Wayland Square Surgicare, a multispeciality surgicenter, is located in the same building as my practice. The physician stockholders of my practice own the building through a Real Estate LLC (Ophthalmic Partners, LLC) to which Wayland Square Surgicare pays rent.	None ———

John M. Blacher Center Place 50 Park Row West, Ste. 404 Providence, RI 02903-1146	*Phone:* (401) 861-3000 *Fax:* (401) 421-9396	TMH Board of Trustees; TMH Governor; Lifespan Investment Committee; TMH Construction Committee	None
Steven L. Blazar, MD Orthopedic Group, Inc. 588 Pawtucket Avenue Pawtucket, RI 02860 Doctor	*Phone:* (401) 722-2400 *Fax:* (401 728-3920 *E-mail:* sblazar@lifespan.org	TMH Board of Trustees; practicing physician	None
Jeffrey G. Brier, CLU, ChFC Brier & Brier One Richmond Square Providence, RI 02906 Insurance Chair	*Phone:* (401) 751-2990 *Fax:* (401) 223-3020 *E-mail:* jgbrier@aol.com	Chair, TMH Board of Trustees and *ex officio* member, Lifespan Board of Directors	None
Frederick S. Crisafulli, MD Medicine Associates Ltd. Nine Pleasant Street Providence, RI 02906 Doctor	*Phone:* (401) 331-6729 *Fax:* (401) 751-3512 *E-mail:* fscrisafulli@yahoo.com	TMH Board of Trustees; Professional and Academic Affairs Committee; practicing physician	None
David L. Edmonds 188 President Avenue Providence, RI 02906	*Phone:* (401) 272-0712 *E-mail:* dle188@netscape.net	TMH Board of Trustees; Professional and Academic Affairs Committee	None
Jonathan D. Fain President Teknor Apex Co. 505 Central Avenue Pawtucket, RI 02861 Industrial	*Phone:* (401) 725-8000 *Fax:* (401) 726-0341 *E-mail:* jfain@teknorapex.com	TMH Board of Trustees; Lifespan Board Nominating Committee	None
Edward D. Feldstein, Esq.** Partner Roberts, Carroll, Feldstein & Pierce, Inc.	*Phone:* (401) 521-7000 *Fax:* (401) 521-1328 *E-mail:* efeldstein@rcfp.com	TMH Board of Trustees; Professional and Academic Affairs Committee; TMH Neighborhood Committee; Lifespan Quality Committee	Shareholder, Roberts, Carroll, Feldstein & Pierce, Inc.; from time to time the firm represents Lifespan and parties that do business with Lifespan.

10 Weybosset Street Providence, RI 02903 Law Firm Vice Chair			
Alan M. Gilstein Partner Piccerelli, Gilstein & Co. 144 Westminster Street Providence, RI 02903 *Ex-officio*	*Phone:* (401) 831-0200 *Fax:* (401) 331-8562 *E-mail:* alang@pgco.com	TMH Board of Trustees; Chair, TMH Foundation	Wife is part-time employee of TMH; daughter is employed by Lifespan as Chief Philanthropy Officer of TMHF
Kathleen C. Hittner, MD President and CEO The Miriam Hospital 164 Summit Avenue Providence, RI 02906	*Phone:* (401) 793-2000 *Fax:* (401) 793-7587 *E-mail:* khittner@lifespan.org	TMH Board of Trustees; TMH Foundation Board of Trustees; *ex officio* member of TMH Board Committees	None
Dayle Hunt Joseph, Ed.D, RN Dean, College of Nursing University of Rhode Island 2 Heathman Road Kingston, RI 02881	*Phone :* (401) 874-5301 *Fax :* (401) 874-3811 *E-mail : Dayle@uri.*edu	TMH Board of Trustees; TMH Governor; TMH Professional and Academic Affairs Committee; Board member RI Free Clinic & Board of St. Elizabeth's Community	None
Mary Jo Kaplan Kaplan Consulting 283 Wayland Avenue Providence, RI 02906 Fundraising Consultant	*Phone:* (401) 421-4886 *E-mail:* Kaplanconsult@aol.com	TMH Board of Trustees; TMH Professional and Academic Affairs Committee;	Husband, Scott Triedman, MD is on staff at TMH and RIH and is a physician with Radiation Oncology Associates
Marie J. Langlois Managing Director Phoenix Investment Management 68 South Main Street Providence, RI 02903 Investment Management Co. Secretary to the Board	*Phone:* (401) 331-6650 *Fax:* (401) 751-4575 *E-mail:* mjlanglois@washtrust.com	TMH Board of Trustees; Trustee of Brown University	Phoenix Investments manages investments for some individuals who are employees of Lifespan.

Bertram M. Lederer Teknor Apex 505 Central Avenue Pawtucket, RI 02861 Industrial	*Phone :* (401) 725-8000 *Fax :* (401) 729-0166 *-mail :* blederer@teknorapex.com	TMH Board of Trustees	None
Alan H. Litwin Kahn, Litwin, Renza & Co., Ltd 951 North Main Street Providence, RI 02904 *Ex-officio* Accountants	*Phone:* (401) 274-2001 *Fax:* (401) 831-4018 *E-mail:* alitwin@kahnlitwin.com	TMH Board of Trustees; Miriam Board of Governors and TMH Finance Committee	Firm performs accounting and tax services for Lifespan PSO, Inc.
Benjamin G. Paster, Esq. Paster & Harpootian 121 South Main Street Providence, RI 02903 Law Firm	Phone : (401) 455-9800 Fax : (401) 455-9801 E-mail : ben@ph-estplan.com	TMH Board of Trustees; TMH Foundation Board of Trustees	None
Samuel K. Suls Chief Financial Officer McLaughlin & Moran, Inc. 40 Slater Road PO Box 20217 Cranston, RI 02920 Anheuser-Busch Distributor Treasurer	*Phone:* (401) 463-5454 *Fax:* (401) 463-3057 *E-mail:* ssuls@mclaughlinmoran.com	TMH Board of Trustees; TMH Finance Committee and Community Affairs Committee	None
George A. Vecchione President and CEO Lifespan 167 Point Street Providence, RI 02903 *Ex-officio*	*Phone:* (401) 444-6699 *Fax :* (401) 444-8700 *E-mail:* gvecchione@lifespan.org	TMH Board of Trustees; Board member, Hospital Association of Rhode Island; Chair, RI Quality Institute; Board Member, Shape Foundation	None

Alfred J. Verrecchia President and CEO Hasbro, Inc. 1011 Newport Avenue Pawtucket, RI 02860 *Ex-officio*	*Phone:* (401) 727-5100 *Fax:* (401) 727-5117 *E-mail:* averrecchia@hasbro.com	TMH Board of Trustees; Director of CVS Corporation	President and CEO of Hasbro, Inc., a donor
Edward J. Wing, MD Chairman, Department of Medicine Brown University, Department of Medicine Rhode Island Hospital 593 Eddy Street Providence, RI 02903	*Phone:* (401) 444-5677 *Fax:* (401) 444-5492 *E-mail:* ewing@lifespan.org	TMH Board of Trustees; RIH Governor	University Medicine Foundation and University Cardiology Foundation who are compensated by Lifespan hospitals for teaching, administrative, and clinical services

2

Corporate ID _____

State of Rhode Island and Providence Plantations

OFFICE OF THE SECRETARY OF STATE
100 NORTH MAIN STREET
PROVIDENCE, RHODE ISLAND 02903-1335

CERTIFICATE OF AMENDMENT TO ARTICLES OF INCORPORATION OF

Lifespan Corporation

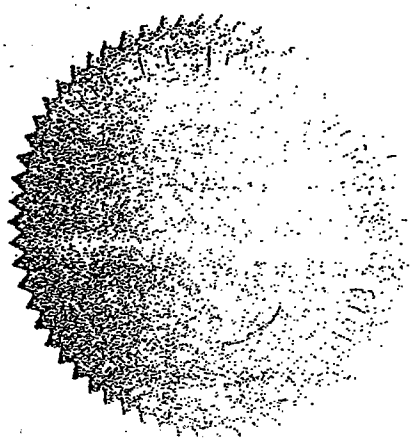
The undersigned, as Secretary of State of the State of Rhode Island, hereby certifies that duplicate originals of Articles of Amendment to the Articles of Incorporation of Lifespan Corporation duly signed pursuant to the provisions of Chapter 7-6 of the General Laws, 1956, as amended, have been received in this office and are found to conform to law.

ACCORDINGLY the undersigned, as such Secretary of State, and by virtue of the authority vested in him by law, hereby issues this Certificate of Amendment to the Articles of Incorporation of Lifespan Corporation and attaches hereto a duplicate original of the Articles of Amendment.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of the State of Rhode Island this fifth day of January A.D., 1996

James R Langevin
Secretary of State

By Kelly E. Pesaturo
Acting Deputy Secretary of State



Form No. N-2C

Filing Fee $10.00

State of Rhode Island and Providence Plantations

OFFICE OF THE SECRETARY OF STATE
100 North Main Street
Providence, Rhode Island
02903-1335

NON-PROFIT CORPORATION

PLEASE TAKE NOTICE
that the corporation must be in good standing prior to filing

DUPLICATE ORIGINAL OF
ARTICLES OF AMENDMENT
TO THE
ARTICLES OF INCORPORATION
OF

LIFESPAN CORPORATION

Pursuant to the provisions of Section 7-6-40 of the General Laws, 1956, as amended, the undersigned corporation adopts the following Articles of Amendment to its Articles of Incorporation:

FIRST: The name of the corporation is Lifespan Corporation

SECOND: The following amendment to the Articles of Incorporation was adopted by the corporation:

(Insert Amendment)

See Schedule A attached hereto and made a part hereof.

FILED
JAN 0 5 1996
By DD#55
154272

Form No. N-2B

THIRD: The amendment was adopted in the following manner: (Note 1)

This Amendment was adopted at a meeting of the Board of Directors held on November 14, 1995 and received the vote of a majority of the Directors in office, there being no members entitled to vote in respect thereof.

Dated January 5, 1996

Lifespan Corporation (Note 2)

By [signature] (Note 3)

Its President

and [signature] (Note 3)

Its Secretary

NOTES:

1. Insert whichever of the following statements is applicable:

   (a) "The amendment was adopted at a meeting of members held on , at which a quorum was present, and the amendment received at least a majority of the votes which members present or represented by proxy at such meeting were entitled to cast."

   (b) "The amendment was adopted by a consent in writing signed under date of by all members entitled to vote in respect thereto."

   (c) "The amendment was adopted at a meeting of the Board of Directors held on , and received the vote of a majority of the Directors in office, there being no members entitled to vote in respect thereof."

2. Exact corporate name of corporation adopting the Amendment.

3. Signatures and titles of officers signing for the corporation.

SCHEDULE A
TO
ARTICLES OF AMENDMENT
OF
LIFESPAN CORPORATION

Article THIRD and Article FOURTH of the Articles of Incorporation are hereby amended in their entirety to read as follows:

THIRD: The purpose or purposes which the corporation is authorized to pursue are:

"to develop, establish, operate, maintain, and provide an integrated, regional system for the delivery of comprehensive, high-quality health services; to undertake, promote, engage and participate in biomedical research and scientific endeavors; to teach, instruct and educate medical students and other healthcare professionals and provide medical education programs in every discipline and at every level; to operate for the benefit of and to support each nonprofit charitable hospital or other health care entity for which the corporation serves as sole member (each referred to as Subsidiary and collectively referred to as Subsidiaries), affiliated corporations of each Subsidiary, and such other charitable, scientific or educational corporations as may be affiliated with this corporation, directly or indirectly, from time to time; and to carry on any other activity that may be lawfully carried on by a corporation formed under the Rhode Island Nonprofit Corporation Act as in effect from time to time."

FOURTH: Any other provisions not inconsistent with law which are presently set forth in the Articles of Incorporation as heretofore amended, as follows:

(If there are no other such provisions, so state.)

"No part of the assets or net earnings of the corporation shall inure to the benefit of any member, officer or director of the corporation or any individual. No substantial part of the activities of the corporation shall be the carrying on of propaganda, or otherwise attempting, to influence legislation except to the extent permitted by Section 501(h) of the Internal Revenue Code; and the Corporation shall not participate in, or intervene in (including the publishing or distributing of statements), any political campaign on behalf of (or in opposition to) any candidate for public office. Upon the liquidation or dissolution of the corporation, after payment of all of the liabilities of the corporation or due provision therefor, all of the assets of the corporation shall be disposed of pursuant to the Rhode Island Nonprofit Corporation Act to the Subsidiaries, or if any of them is not then in existence and exempt from federal income tax under Section 501(c)(3) of the Internal Revenue Code, to one or more organizations with similar purposes and similar tax exemption.

A director of the corporation shall not be personally liable to the corporation or its members for monetary damages for breach of the director's duty as a director, except for liability (i) for any breach of the director's duty of loyalty to the corporation or its members, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of the law, or (iii) for any transaction from which the director derived an improper personal benefit. If the Rhode Island Nonprofit Corporation Act is amended to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the corporation shall be eliminated or limited to the fullest extent permitted by the Rhode Island Nonprofit Corporation Act, as so amended. Any repeal or modification of the provisions of this Article by the corporation shall not adversely affect any right or protection of a director of the corporation existing at the time of such repeal or modification."

Filing Fee $10.00

State of Rhode Island and Providence Plantations
NON-PROFIT CORPORATION

DUPLICATE ORIGINAL OF
RESTATED ARTICLES OF INCORPORATION

OF

LIFESPAN CORPORATION

Pursuant to the provisions of Section 7-6-42 of the General Laws, 1956, as amended, the undersigned corporation executes the following Restated Articles of Incorporation for the purpose of restating its Articles of Incorporation as amended in a single instrument:

FIRST: The name of the corporation is Lifespan Corporation.

SECOND: The period of its duration is perpetual.

THIRD: The purpose or purposes which the corporation is authorized to pursue are:

"to develop, establish, operate, maintain, and provide an integrated, regional system for the delivery of comprehensive, high-quality health services; to undertake, promote, engage and participate in biomedical research and scientific endeavors; to teach, instruct and educate medical students and other healthcare professionals and provide medical education programs in every discipline and at every level; to operate for the benefit of and to support The Miriam Hospital and Rhode Island Hospital, their affiliated corporations and such other charitable, scientific or educational corporations as may be affiliated with this corporation, directly or indirectly, from time to time; and to carry on any other activity that may be lawfully carried on by a corporation formed under the Rhode Island Non-Profit Corporation Act as in effect from time to time."

FOURTH: Any other provisions not inconsistent with law which are presently set forth in the Articles of Incorporation as heretofore amended, are as follows:

(If there are no other such provisions, so state.)

No part of the assets or net earnings of the corporation shall inure to the benefit of any member, officer or director of the corporation or any individual. No substantial part of the

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AUG 9 1994

activities of the corporation shall be the carrying on of propaganda, or otherwise attempting, to influence legislation except to the extent permitted by Section 501(h) of the Internal Revenue Code; and the Corporation shall not participate in, or intervene in (including the publishing or distributing of statements), any political campaign on behalf of (or in opposition to) any candidate for public office. Upon the liquidation or dissolution of the corporation, after payment of all of the liabilities of the corporation or due provision therefor, all of the assets of the corporation shall be disposed of pursuant to the Rhode Island Nonprofit Corporation Act to The Miriam Hospital and Rhode Island Hospital, or if either is not then in existence and exempt from federal income tax under Section (501)(c)(3) of the Internal Revenue Code, to one or more organizations with similar purposes and similar tax exemption."

A director of the corporation shall not be personally liable to the corporation or its members for monetary damages for breach of the director's duty as a director, except for liability (i) for any breach of the director's duty of loyalty to the corporation or its members, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of the law, or (iii) for any transaction from which the director derived an improper personal benefit. If the Rhode Island Non-Profit Corporation Act is amended to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the corporation shall be eliminated or limited to the fullest extent permitted by the Rhode Island Non-Profit Corporation Act, as so amended. Any repeal or modification of the provisions of this Article by the corporation shall not adversely affect any right or protection of a director of the corporation existing at the time of such repeal or modification.

FIFTH: These Restated Articles of Incorporation correctly set forth without change the corresponding provisions of the Articles of Incorporation as heretofore amended, have been duly adopted as required by law, and supersede the Original Articles of Incorporation and all amendments thereto.

Dated 8/8, 1994

LIFESPAN CORPORATION

By: _____

Its President

and _____

Its Secretary

72541

Corporate ID _____

State of Rhode Island and Providence Plantations

OFFICE OF THE SECRETARY OF STATE
CERTIFICATE OF AMENDMENT
TO ARTICLES OF INCORPORATION
OF

The Miriam Corporation

The undersigned, as Secretary of State of the State of Rhode Island, hereby certifies that duplicate originals of Articles of Amendment to the Articles of Incorporation of The Miriam Corporation duly signed pursuant to the provisions of Chapter 7-6 of the General Laws, 1956, as amended, have been received in this office and are found to conform to law.

ACCORDINGLY the undersigned, as such Secretary of State, and by virtue of the authority vested in her by law, hereby issues this Certificate of Amendment to the Articles of Incorporation of The Miriam Corporation and attaches hereto a duplicate original of the Articles of Amendment.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of the State of Rhode Island this ninth day of August A.D., 19 94

Barbara M. Leonard
Secretary of State

By Jane Berthiaume
Acting *Deputy Secretary of State*

FILED
AUG 9 1994
By

127170

Form No. N-2C

LIFESPAN CORPORATION

BYLAWS

Restated in Entirety:

January 5, 1996

Amended:

March 13, 1996

January 15, 1997

March 18, 1997

October 31, 1997

December 12, 2000

November 5, 2002

April 13, 2004

LIFESPAN CORPORATION
BYLAWS

ARTICLE I

ARTICLES OF INCORPORATION, CORPORATE SEAL, FISCAL YEAR, GENDER AND GOVERNORS

Section 1.1. Articles of Incorporation. The name and purposes of the corporation (the "Corporation") shall be as set forth in its Articles of Incorporation. These Bylaws, the powers of the Corporation and of its directors and officers, and all matters concerning the conduct and regulation of the affairs of the Corporation shall be subject to such provisions in regard thereto, if any, as are set forth in the Articles of Incorporation as from time to time in effect.

Section 1.2. Location. The principal office of the Corporation in the State of Rhode Island shall be located at such place as the directors may from time to time determine.

Section 1.3. Corporate Seal. The directors may adopt and alter a seal of the Corporation.

Section 1.4. Fiscal Year. The fiscal year of the Corporation shall end on September 30 in each year.

Section 1.5. Gender. The pronoun "he" or "his," when appropriate, shall be construed to mean also "she" or "her."

Section 1.7. Governors.

Section 1.7.1. Establishment of Governors. The Board of Directors shall appoint an advisory body known as Governors of the Corporation (collectively, the "Governors" and each individually a "Governor"). The Governors shall consist of not more than one hundred twenty-five (125) persons, including the Chair, *ex officio*. The Governors shall be appointed annually for a term of one year or until the next annual meeting of the Board of Directors. Prior to every annual meeting of the Board of Directors, a slate of candidates recommended to serve as Governors shall be prepared in the manner and pursuant to the nomination process

described in Section 5.3. At each annual meeting, the directors then in office shall determine the number of Governors for the ensuing year, and shall elect for a term of one (1) year the appropriate number of Governors.

Each Governor shall continue to serve until the next annual meeting of the Board of Directors or until he sooner dies, resigns, or is removed.

Section 1.7.2. Responsibilities. The Governors shall engage in the following activities as appropriate and when needed by the Corporation:

(i) Be available to serve on Board committees and advisory councils;

(ii) Participate in philanthropy efforts; and

(iii) Participate in efforts to enhance community relations and advocate public policy consistent with the Corporation's mission.

Except as expressly provided in these Bylaws, the Governors shall not have the power to vote on matters affecting the Corporation and shall not serve as members of the Corporation.

Section 1.7.3. Meetings. Meetings of the Governors may be held at any time and at any place when called by the President, the Chair or the Board of Directors, and shall be called by the Secretary or, in the case of the death, absence or incapacity of the Secretary, by any other officer. Notice of the time and place of each meeting of the Governors shall be given by the Secretary to the Governors by mail or facsimile addressed to each Governor at his principal business or residence address.

ARTICLE II

BOARD OF DIRECTORS

Section 2.1. General Powers. All of the powers and authority of the Corporation shall be vested in the Board of Directors which shall oversee the management of the affairs of the Corporation, and the Board of Directors' powers shall include, but not be limited to, the power to:

(a) plan, direct and establish policy, including recommendations regarding quality standards and measurements, to assure the development and delivery of quality health services, professional education and biomedical research by the individual hospitals and other health care entities listed in Exhibit A attached hereto (collectively, the "Health Care Entities" and each individually a "Health Care Entity") and each other organization directly or indirectly owned or controlled by the Corporation from time to time (together with the Health Care Entities, the "Affiliates") on an integrated, cost-effective basis and, in furtherance thereof, to have and exercise with respect to each Affiliate the powers described below in this Section 2.1 and in Section 2.3;

(b) formulate the system mission and vision of the Corporation and approve key policies to accomplish such mission and vision;

(c) approve the strategic plans of the Corporation;

(d) exercise general oversight responsibility for the financial affairs of the Corporation and each Affiliate, including, with respect to the Corporation:

(i) establishment and maintenance of accounting policies for the Corporation and the Affiliates and appointment of outside auditors for the Corporation and each Affiliate;

(ii) establishment of policy regarding key performance standards and objectives, including financial performance, of the Corporation;

(iii) approval of capital expenditures of the Corporation;

(iv) approval of long-term debt of the Corporation; and

(v) oversight of the management of investments of the Corporation;

(e) negotiate, develop and approve all managed care products for the Corporation and each Affiliate;

(f) negotiate, develop and approve affiliation agreements for education and research between Brown University School of Medicine or other academic institutions and each Affiliate;

(g) establish policy and approvals for mergers, acquisitions and joint ventures of the Corporation;

(h) approve human resources plans for (i) the Corporation, including executive compensation and benefit plans and (ii) each Affiliate, including executive compensation and benefit plans, in concert with the Corporation's human resource planning; and

(i) select and evaluate the performance of the President of the Corporation.

Section 2.2. System Parent Powers. In furtherance of the purpose and mission of the Corporation of operating an integrated academic health system and in order to provide the means of effective oversight, coordination and support of such system by the Corporation, the Board of Directors shall ensure that the Corporation is granted such rights and powers in the Articles of Incorporation, the bylaws or other governing instrument of each Affiliate as the Board of Directors in their discretion may determine to be necessary or convenient for such purposes including, but not limited to, those powers and rights listed in subsections (a), (d), (e), (f) and (h) of Section 2.1 and, in addition, the rights and powers described in Section 2.3 below (the "Reserved Powers").

Section 2.3. Reserved Powers.

(a) Subject to the Articles of Incorporation and bylaws of each Affiliate, the power to authorize: (i) the amendment and restatement of Articles of Incorporation or other charter documents and of the bylaws of each Affiliate; (ii) the merger or consolidation of each Affiliate with any other entity; (iii) the sale, lease, exchange, mortgage, pledge or other disposition of all or substantially all the property and assets of each Affiliate; and (iv) the voluntary dissolution of each Affiliate, the plan of distribution of assets upon dissolution and revocation of voluntary dissolution proceedings;

(b) The power to approve (i) each Affiliate's strategic plans, and (ii) subject to the Articles of Incorporation and bylaws of each Affiliate, proposed changes to its mission statement;

(c) The power to approve and monitor each Affiliate's (i) capital budgets, (ii) operating budgets, and (iii) non-budgeted material expenditures (as "material" is established by the Corporation's Board of Directors from time to time);

(d) The power to monitor the delivery of services of each Affiliate, which includes the power to (i) evaluate plans for new services and opportunities, (ii) evaluate the establishment by the Affiliate of a new or additional location for the delivery of health care services, (iii) receive and assess comparable data relevant to

the quality of services in the region among the Affiliate and other Affiliates, (iv) monitor the health status indicators of the population served by the Affiliate, (v) evaluate the appropriateness of adding or discontinuing services of the Affiliate, and (vi) monitor the Affiliate's relationships with affiliated educational institutions;

(e) The power to authorize each Affiliate's participation in a joint venture, consolidation, network, association, system or alliance of health care providers;

(f) The power to authorize each Affiliate's organization or formation of a new subsidiary or joint venture in which the Affiliate's ownership interest will be equal to or in excess of fifty percent (50%) of net income or voting interest;

(g) The power to authorize each Affiliate's incurrence or guarantee of material indebtedness to any other person or entity (as "material" is established by the Corporation's Board of Directors from time to time) and a mortgage, pledge or grant of a security interest in, property or assets of such Affiliate in connection with any such indebtedness;

(h) The power to approve each Affiliate's investment policies;

(i) The power to elect or approve and to remove the chair, vice-chair, secretary and treasurer and members of each Affiliate's governing body (except as otherwise provided in an Affiliate's bylaws);

(j) The power to authorize any vote by each Affiliate of its capital stock or membership voting rights in any and all of its subsidiaries or affiliates with respect to any of the foregoing; and

(k) The power to have the Chair or his designee sit on the board of directors or other governing body of each Health Care Entity as a non-voting (or voting, as provided in an Affiliate's bylaws) *ex officio* member and the right to have the President of the Corporation or his designee sit on the board of directors or other governing body of each Affiliate as a non-voting (or voting, as provided in an Affiliate's bylaws) *ex officio* member.

Section 2.4. Direction and Control of Disposition of Donor-Restricted Funds. Notwithstanding any provision hereof having application to the contrary, the disposition of the donor-restricted assets of each Health Care Entity or Affiliate shall remain at all times under the exclusive direction and control of the board of directors or other governing body of such Health Care Entity or Affiliate.

Section 2.5. Delegation to President. The President of the Corporation may execute such written consents of this Corporation in lieu of taking actions at annual, regular and special meetings of each Affiliate of which the Corporation serves as member or stockholder as the President may in the President's discretion determine to be necessary or advisable; provided, that prior to executing any such written consent authorizing such actions, the President shall be expressly authorized to do so by the Board of Directors.

Section 2.6. Furtherance of Affiliate Purposes. The Board of Directors and its duly authorized representatives shall exercise all statutory rights, prerogatives, privileges and Reserved Powers of this Corporation in its capacity as member, stockholder or other controlling person with respect to each Affiliate, subject to the provisions of Section 2.2, in a manner consistent with and in furtherance of the purposes of such Affiliate and of this Corporation. Furthermore, members of Board of Directors are encouraged to serve as members of the various committees of the Affiliates.

Section 2.7. Number, Election and Term. The Board of Directors of the Corporation (herein sometimes referred to as the "Board") shall consist of not less than fourteen (14) nor more than twenty (20) persons and, in addition, the President who shall serve *ex officio*. The number of directors shall be determined at each annual meeting and from time to time by resolution of the Board of Directors. Included among the persons so serving shall be the chairs of Rhode Island Hospital, The Miriam Hospital, Newport Hospital, and Emma Pendleton Bradley Hospital, who shall serve *ex officio*. Notwithstanding the foregoing, the chair of each aforementioned affiliate may, no later than the annual meeting of the Corporation, designate a trustee of said affiliate to serve as a director in his or her place, and such designation shall be effective until the following annual meeting of the Corporation; during the period of service by any such designee, the respective chair shall not serve as a director. The elected directors shall continue to serve until the next annual meeting of the Board of Directors or until he sooner dies, resigns, or is removed. At any special or regular meeting, the directors may increase the number of directors and elect new directors to complete the number so fixed, or the directors may decrease the number of directors, but only to eliminate vacancies existing by reason of the death, resignation, removal or disqualification of one or more directors.

Section 2.8. Annual Meeting. There shall be an annual meeting of the Board of Directors at such date and time as shall be determined by the directors or the Chair.

Section 2.9. Regular Meetings. Regular meetings of the directors may be held at such places and at such times as the directors may determine.

Section 2.10. Special Meetings. Special meetings of the directors may be held at any time and at any place when called by the Chair or by five (5) or more directors.

Section 2.11. Notice of Meetings. Notice of the time and place of each regular, annual and special meeting of the directors shall be given to each director by mail or facsimile at least five (5) days before the meeting addressed to him at his usual or last known business or residence address or in person or by telephone at least twenty-four (24) hours before the meeting. Whenever notice of a meeting is required, such notice need not be given to any director if a written waiver of notice, executed by him (or his attorney thereunto authorized) before or after the meeting, is filed with the records of the meeting, or to any director who attends the meeting without protesting prior thereto or at its commencement the lack of notice to him. Neither such notice nor waiver of notice need specify the purposes of the meeting, unless otherwise required by law, the Articles of Incorporation or these Bylaws.

Section 2.12. Quorum. At any meeting of the directors, a majority of the number of directors fixed at the most recent annual meeting of the directors shall constitute a quorum. Any meeting may be adjourned by a majority of the votes cast upon the question, whether or not a quorum is present, and the meeting may be held as adjourned without further notice.

Section 2.13. Action by Vote. When a quorum is present at any meeting, the affirmative vote of a majority of the directors present and voting shall decide any question, unless otherwise provided by law, the Articles of Incorporation or these Bylaws.

Section 2.14. Action by Writing. Any action required or permitted to be taken at any meeting of the directors may be taken without a meeting if all the directors with voting powers consent to the action in writing and the written consents are filed with the records of the meetings of the directors. Such consents shall be treated for all purposes as a vote at a meeting.

Section 2.15. Presence Through Communications Equipment. Unless otherwise provided by law or the Articles of Incorporation, members of the Board of Directors may participate in a meeting of such Board by means of a conference telephone or similar communications equipment by means of which all persons participating in a meeting can communicate with each other at the same time, and participation by such means shall constitute presence in person at a meeting.

ARTICLE III

OFFICERS

Section 3.1. Officers. The officers of the Corporation shall be a Chair, one or more Vice-Chairs, a Treasurer, a Secretary and a President and such other officers as may be deemed necessary.

Section 3.2. Election and Tenure of Officers.

Section 3.2.1. Chair and Vice-Chairs. The Chair and the Vice-Chair(s) shall be chosen from among the directors and shall be elected by the Board of Directors annually, and each such officer shall serve for a term of one (1) year and until a successor is elected and qualified.

Section 3.2.2. Other Officers. The President shall be appointed by the Board of Directors and shall serve at its pleasure. The Secretary and the Treasurer shall be appointed by the Chair subject to the approval of the Board of Directors. Each of the Secretary and the Treasurer shall serve for a term of one year and until such officer's successor is appointed and qualified.

Section 3.2.3. Nomination of Officers. The Chair and Vice-Chair(s) shall be elected from among a slate of candidates prepared by the nominating committee described in Section 5.3.

Section 3.3. Duties of Chair. In addition to the duties and authority specifically delegated to the Chair elsewhere in these Bylaws, the Chair shall (a) preside at all meetings of the Board of Directors, (b) report in writing at the annual meeting of the Board of Directors on the condition of affairs of the Corporation and make recommendations with respect thereto, and (c) perform such other duties as the Board of Directors may prescribe from time to time.

Section 3.4. Duties of Vice-Chair(s). In the absence or inability of the Chair to act, the Vice-Chair (or, if more than one Vice-Chair has been appointed, a Vice-Chair selected by the Board of Directors) shall have the powers and perform all of the duties of the Chair. The Vice-Chairs shall have such other powers and perform such other duties as the Board of Directors may prescribe from time to time.

Section 3.5. Duties of President. The President shall be the chief executive officer of the Corporation and, in that capacity, shall, in general, supervise, manage and control all of the business and affairs of the Corporation and perform all duties incident to

the office of the President and Chief Executive Officer and such other duties as may be prescribed by these Bylaws or, from time to time, by the Board of Directors. The President shall appoint the executive management of the Corporation. In addition, the President shall appoint the president of each Health Care Entity and each Affiliate, in consultation with the governing body of the Health Care Entity or Affiliate for whom such president is to be appointed, and the president of each Health Care Entity and each Affiliate shall serve at the pleasure of the President, and the President, and only the President, in consultation with the governing body of the Health Care Entity or Affiliate for whom such president was appointed, may remove each such president. The President's performance will be evaluated annually by the Board of Directors under the direction of the Chair.

Section 3.6. Duties of Treasurer. The Treasurer shall have the responsibility to ensure the safekeeping of all of the funds of the Corporation. Acting with the Board of Directors, the Treasurer shall ensure that a true and accurate accounting of the financial transactions of the Corporation is made and that reports of such transactions are presented to the Board of Directors. The Treasurer shall also perform such other duties as are incident to the office of the Treasurer and/or as are assigned to him from time to time by the Board of Directors.

Section 3.7. Duties of Secretary. The Secretary shall issue notices for and keep minutes of all meetings of the Board of Directors, shall have charge of the corporate seal and corporate books, and, in general, shall perform all of the duties incident to the office of Secretary and such other duties as are assigned to him from time to time by the Board of Directors.

ARTICLE IV

RESIGNATIONS, REMOVALS AND VACANCIES

Section 4.1. Resignations. Any Governor, director or officer may resign at any time by delivering his resignation in writing to the Chair, the President or the Secretary or to the Corporation at its principal office. Such resignations shall be effective upon receipt unless specified to be effective at some other time.

Section 4.2. Removal. A director may be removed only with cause by vote of the directors then in office who have voting powers. An officer may be removed with or without cause by the vote of the directors then in office who have voting powers. A

director or officer may be removed with cause only after reasonable notice and opportunity to be heard before the Board of Directors. A Governor may be removed with or without cause by vote of the directors then in office who have voting powers.

Section 4.3. Vacancies. Any vacancy in the Board of Directors may be filled by vote of the remaining directors then in office. Any director so elected to fill a vacancy shall serve until the next annual meeting of the Corporation at which time such vacancy shall be filled in accordance with the procedure then in effect for electing directors. Any vacancy in the officers shall be filled in the manner prescribed herein for the election or appointment of such officers. Each officer so elected to fill a vacancy shall hold office for the unexpired term and in the case of the President, Treasurer and Secretary until his successor is chosen or qualified, or in each case until he sooner dies, resigns, is removed or becomes disqualified. The directors shall have and may exercise all of the powers of the Board of Directors notwithstanding the existence of one or more vacancies in their number.

ARTICLE V

COMMITTEES

Section 5.1. Standing Committees. The standing committees of the Corporation shall be as follows: (1) Finance; (2) Audit and Compliance; (3) Quality Oversight; (4) Investment; and (5) Community Affairs. The Chair, or at the Chair's election one or both Vice-Chairs, and the President of the Corporation shall be *ex officio* members of the standing committees.

The Chair, in consultation with the Vice-Chairs, shall appoint the Chair and Vice-Chair of each committee whether standing or created under Section 5.2 ("special committees"). The Chair, in consultation with the chair of each committee, shall appoint the members of each committee. Except to the extent otherwise required by law or these Bylaws, committee members, other than the chairperson or co-chairperson, need not be members of the Board of Directors of the Corporation or officers of the Corporation and there shall be at least one medical doctor on each committee. The chairperson or co-chairperson of each committee, however, must be a member of the Board of Directors. The Chair shall confer with each *ex officio* member of the Board of Directors identified in Section 2.7 to seek recommendations with respect to Standing Committee membership, and shall ensure that each committee has at least one member who is knowledgeable about the particular needs and interests of each Affiliate named in Section 2.7.

The responsibilities of the Standing Committees shall be as follows:

Section 5.1.1. Finance Committee. The Finance Committee shall have general oversight responsibility for the financial affairs of the Corporation. It shall, with respect to the Corporation and its Affiliates, review their financial condition and operating results; review and approve annual operating and capital budgets; review forecasts of future operations, capital needs and cash flow; review and approve all proposed borrowing; review funding levels of pension plans; and review proposed material transactions and other obligations. It shall recommend appropriate actions, including the exercise of relevant Reserved Powers of the Corporation, to the Board of Directors.

Section 5.1.2. Audit and Compliance Committee. The Audit and Compliance committee shall be responsible for making recommendations to the Board of Directors on the appointment of independent auditors for the Corporation, the Affiliates and the Affiliates' related entities; for reviewing the results of the audit and Management's response to the auditor's management letter; for monitoring the effectiveness of the systems of internal controls in place at the Corporation and its Affiliates; and for reviewing and approving internal audit reports and management's response to such reports. The Committee shall approve and monitor implementation of the Corporation's compliance plan and shall make recommendations as appropriate to the to the Board of Directors.

Section 5.1.3. Quality Oversight Committee. The Quality Oversight Committee shall have general oversight responsibility to ensure the provision of high-quality services throughout the Corporation. It will monitor the effectiveness of the Affiliates quality-monitoring processes, establish key indicators of safety, satisfaction and clinical performance to be measured by each Affiliate, and shall advise the Board of Directors of key issues relative to the delivery of quality health care.

Section 5.1.4. Investment Committee. The Investment Committee shall be responsible for overseeing investment of the funds of the Corporation and its Affiliates. The Committee shall approve investment policies and procedures and shall approve the engagement of outside organizations to manage investments and advise the Corporation with respect to such investments.

Section 5.1.5. Community Affairs Committee. The Community Affairs Committee shall be responsible for creating mechanisms and opportunities for community and professional groups to ask questions, receive information, make suggestions, and voice comments or concerns about the organization and delivery

of health care services by the Corporation and the Health Care Entities. The Committee may make reports and recommendations to the Board of Directors or to the boards of trustees of the Health Care Entities, as appropriate.

Section 5.2. Special Committees. The Chair may appoint an Executive Committee, subject to the approval of the Board of Directors, and such other committees as may from time to time be deemed suitable, necessary, or convenient to aid in accomplishing the purposes of the Corporation. The duties and powers of any such committee and the terms of office of its members shall be prescribed by the Board of Directors. The Chair shall appoint a Compensation Committee which shall be responsible for overseeing the compensation of the Corporation's senior officers.

Section 5.3. Nominating Committee. The Chair shall appoint, subject to the approval of the Board of Directors, a nominating committee that shall nominate individuals to serve as Governors, directors and elected officers of the Corporation. The nominating committee shall consist of three (3) directors, one of whom shall serve as the chair of the committee, and two (2) other persons, at least one of whom shall be a Governor.

With respect to the nomination of Governors, prior to each annual meeting of the Board of Directors, the nominating committee shall review and update a profile of the community that the Corporation serves to ensure that representation by the Governors best reflects such community as well as the skills and abilities that the Corporation requires for Governors. No less than sixty (60) days prior to the annual meeting of the Governors, each tax-exempt Affiliate of the Corporation, and any current Governor may submit to the nominating committee the names of candidates for nomination by the nominating committee. Additionally, the Nominating Committee may, and is encouraged to, seek the names of candidates from other interested organizations and groups in the community that the Corporation serves to assure a broad and diverse group from which to select nominees. The nominating committee shall consider these candidates for nomination as well as other individuals chosen by the nominating committee and shall select for nomination as Governors a slate of individuals who reflect the community interests and characteristics identified in the community profile, as well as the traditional constituencies of the Affiliates, and embody the skills and abilities required to perform the functions of a Governor. At the annual meeting of the Board of Directors, the nominating committee shall move for the election of new Governors, and the directors may elect such candidates nominated by the nominating committee.

With respect to the nomination of directors, no less that sixty (60) days prior to the annual meeting of the Board of Directors, each tax-exempt Affiliate of the Corporation may submit to the Nominating Committee the names of candidates for nomination by the

Nominating Committee. Prior to each annual meeting of the Board of Directors, the nominating committee shall prepare a slate of candidates to be elected to serve as directors, giving consideration to the community profile described above and the skills and abilities required to perform the functions of a director. At the annual meeting of the Board of Directors, the nominating committee shall move for the election of new directors, and the directors may elect such candidates nominated by the nominating committee.

If the directors fail to elect any of the nominating committee's nominees for directors positions, and if the number of directors designated for the upcoming year has not been elected, the nominating committee may nominate individuals to serve as directors at a special meeting of the Board of Directors called for that purpose until the Board of Directors elects the requisite number of directors.

Section 5.4. Quorum and Voting. A majority of the number of Committee members shall constitute a quorum for the transaction of business at any meeting of a standing or special committee and the vote of a majority of those members present and constituting a quorum shall be the act of the Committee.

Section 5.5. Records of Meetings. A written summary of all actions taken at each Committee meeting shall be prepared and submitted to the Board of Directors.

ARTICLE VI

INDEMNIFICATION

Section 6.1. Indemnification of Non-Employee Officers, Directors, Governors and Members of Committees. The Corporation shall indemnify to the fullest extent permitted under Rhode Island General Laws §7-6-6, as amended from time to time, or any other applicable law related or succeeding thereto then in effect, every Governor, director, non-employee officer or member of a committee of the Corporation made a party to a proceeding by reason of such person being or having been a Governor, director, non-employee officer or member of a committee of the Corporation against judgments, penalties, fines, settlements and reasonable expenses actually incurred, including those expenses actually incurred prior to the final disposition of such proceeding, subject to the limitations, if any, contained in Rhode Island General Laws §7-6-6, as amended from time to time, or in any other applicable law related or succeeding thereto then in effect.

Section 6.2. Indemnification of Employees. The Corporation may indemnify to the fullest extent permitted under Rhode Island General Laws §7-6-6, as amended from time to time, or any other applicable law related or succeeding thereto then in effect, any employee made a party to a proceeding by reason of such person being or having been an employee of the Corporation against judgments, penalties, fines, settlements and reasonable expenses actually incurred, including those expenses actually incurred prior to the final disposition of such proceeding, subject to the limitations, if any, contained in Rhode Island General Laws §7-6-6, as amended from time to time, or in any other applicable law related or succeeding thereto then in effect; provided, however, if such employee is made a party to a proceeding by reason of also being or having been a non-employee officer, director, Governor or member of a committee of the Corporation, then the Corporation shall indemnify the employee against those judgments, penalties, fines, settlements and reasonable expenses actually incurred in connection with such employee's service as a non-employee officer, director, Governor or member of a committee of the Corporation in accordance with Section 6.1 above and the Corporation may indemnify the employee against those judgments, penalties, fines, settlements and reasonable expenses actually incurred in connection with such employee's service as an employee.

ARTICLE VII

CONFLICT OF INTEREST

Any contract or other transaction between the Corporation and one or more of its Governors, directors, officers or members of a committee of the Corporation or between the Corporation and any other corporation, firm or association in which one or more of its Governors, directors, officers or members of a committee of the Corporation are officers or directors or have a financial interest shall be voidable unless (1) at a meeting of the Board of Directors or committee authorizing or ratifying the contract or transaction there is a quorum of persons not so interested and the contract or other transaction is approved by a majority of such quorum, or (2) the contract or other transaction is just and reasonable to the Corporation at the time it is made, authorized or ratified.

ARTICLE VIII

PERSONAL LIABILITY

The Governors, directors and officers of the Corporation shall not be personally liable for any debt, liability or obligation of the Corporation. All persons, corporations or other entities extending credit to, contracting with, or having any claim against, the

Corporation, may look only to the funds and property of the Corporation for the payment of any such contract or claim or for the payment of any debt, damages, judgment or decree, or of any money that may otherwise become due or payable to them from the Corporation.

ARTICLE IX

AMENDMENTS

These Bylaws may be altered, amended or repealed at any meeting of the directors by vote of the directors. Any amendment will be effective twenty days following written notice of such amendment to the Attorney General of Rhode Island.

EXHIBIT A

Health Care Entities

Rhode Island Hospital
The Miriam Hospital
Emma Pendleton Bradley Hospital
Lifespan Diversified Services, Inc.
Newport Health Care Corporation
Newport Hospital
Lifespan of Massachusetts, Inc.

Corporate ID _____

State of Rhode Island and Providence Plantations

OFFICE OF THE SECRETARY OF STATE
100 NORTH MAIN STREET
PROVIDENCE, RHODE ISLAND 02903-1335

CERTIFICATE OF AMENDMENT TO ARTICLES OF INCORPORATION OF

The Miriam Hosptial

The undersigned, as Secretary of State of the State of Rhode Island, hereby certifies that duplicate originals of Articles of Amendment to the Articles of Incorporation of The Miriam Hospital duly signed pursuant to the provisions of Chapter 7-6 of the General Laws, 1956, as amended, have been received in this office and are found to conform to law.

ACCORDINGLY the undersigned, as such Secretary of State, and by virtue of the authority vested in him by law, hereby issues this Certificate of Amendment to the Articles of Incorporation of The Miriam Hospital and attaches hereto a duplicate original of the Articles of Amendment.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of the State of Rhode Island this twenty-seventh day of August A.D., 19 97

James R Langevin
Secretary of State

By Cathryn J. Villanis
Acting Deputy Secretary of State

Form No. N-2C

Filing Fee $10.00

State of Rhode Island and Providence Plantations

OFFICE OF THE SECRETARY OF STATE
100 North Main Street
Providence, Rhode Island
02903-1335

NON-PROFIT CORPORATION

PLEASE TAKE NOTICE
that the corporation must be in good standing prior to filing

DUPLICATE ORIGINAL OF

ARTICLES OF AMENDMENT

TO THE

ARTICLES OF INCORPORATION

OF

The Miriam Hospital

Pursuant to the provisions of Section 7-6-40 of the General Laws, 1956, as amended, the undersigned corporation adopts the following Articles of Amendment to its Articles of Incorporation:

FIRST: The name of the corporation is The Miriam Hospital

SECOND: The following amendment to the Articles of Incorporation was adopted by the corporation:

(Insert Amendment)

See Exhibit A

AUG 27 8 57 AM '97
RECEIVED
SECRETARY OF STATE

FILED
AUG 27 1997
DC#63
By 189932

Form No. N-2B

THIRD: The amendment was adopted in the following manner: (Note 1)

The amendment was adopted at a meeting of members held on June 10, 1997, at which a quorum was present, and the amendment received at least a majority of the votes which members present or represented by proxy at such meeting were entitled to cast.

Dated August 13, 1997

The Miriam Hospital (Note 2)

By _____ (Note 3)
Steven D. Baron

Its President ~~or Vice-President~~

and _____ (Note 3)
Jeffrey Brier

Its Secretary ~~or Assistant Secretary~~

NOTES:

1. Insert whichever of the following statements is applicable:

   (a) "The amendment was adopted at a meeting of members held on , at which a quorum was present, and the amendment received at least a majority of the votes which members present or represented by proxy at such meeting were entitled to cast."

   (b) "The amendment was adopted by a consent in writing signed under date of by all members entitled to vote in respect thereto."

   (c) "The amendment was adopted at a meeting of the Board of Directors held on , and received the vote of a majority of the Directors in office, there being no members entitled to vote in respect thereof."

2. Exact corporate name of corporation adopting the Amendment.

3. Signatures and titles of officers signing for the corporation.

[Proposed Amendment for Articles of Amendment to the Articles of Incorporation of The Miriam Hospital]

EXHIBIT A

Article THIRD of the Articles of Incorporation of The Miriam Hospital is hereby amended and restated in its entirety as follows:

"

=

THIRD: The purpose or purposes which the corporation is authorized to pursue are: ~~To~~ to organize, erect, acquire, equip, transact and maintain a hospital for the sick, disabled, and injured and to promote the charitable, scientific and educational purposes of Lifespan Corporation, a nonprofit corporation organized and existing under the Rhode Island Nonprofit Corporation Act, and each of the corporations and other organizations that may be directly or indirectly affiliated with Lifespan Corporation from time to time in an integrated, regional system for the delivery of comprehensive health services."

Corporate ID _____

State of Rhode Island and Providence Plantations

OFFICE OF THE SECRETARY OF STATE

RESTATED CERTIFICATE OF INCORPORATION

OF

The Miriam Hospital

The undersigned, as Secretary of State of the State of Rhode Island, hereby certifies that duplicate originals of Restated Articles of Incorporation of The Miriam Hospital, duly signed pursuant to the provisions of Chapter 7-6 of the General Laws, 1956, as amended, have been received in this office and are found to conform to law.

ACCORDINGLY the undersigned, as such Secretary of State, and by virtue of the authority vested in her by law, hereby issues this Restated Certificate of Incorporation of The Miriam Hospital and attaches hereto a duplicate original of the Restated Articles of Incorporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seal of the State of Rhode Island this ninth day of August A.D., 19 94

Barbara M. Leonard
Secretary of State

By Jane Butkiewicz
Acting *Deputy Secretary of State*

FILED

AUG 9 1994

By 12717

Form No. N-3C

receive, hold, purchase, possess and acquire land by purchase, lease, gift or devise and to erect thereon or otherwise acquire suitable buildings and equipment."

Sec. 3. "Said corporation may for its corporate purposes take, receive, hold and possess real and personal estate without limitation as to amount and the property and estate of said corporation shall not at any time be liable to be assessed in the apportionment of any state or town tax."

Sec. 4. "The said corporation shall ordain, institute, establish and put in execution such rules, regulations and by-laws as may be deemed expedient for the internal government and economy of the institution, and have the managing, governing and conducting of all of the affairs thereof and of all the officers, agents and persons employed by them in and about the establishment or elsewhere, and may alter and amend the said rules, regulations and by-laws at pleasure, provided, that the same are not repugnant to the laws of the state, or of the United States, and may generally do and transact all other matters and things fit and proper for bodies corporate to do and transact."

Sec. 5. "The said hospital and all the property and concerns of the corporation, shall be under the direction and management of the board of trustees, which said board shall be established and empowered in accordance with the by-laws, rules and regulations adopted or to be adopted by said incorporators."

Sec. 6. "The said corporation may, at their first and any subsequent meeting, elect a president, vice presidents, treasurer and secretary, members of the board of trustees and members of the board of directors and all other necessary and convenient officers, who shall have such power and authority as the said corporation may think proper to prescribe and grant to them: and who shall be elected in such manner and for such periods of time as the by-laws of the said corporation may provide, and shall in like manner remain in office until others are chose in their stead."

Sec. 7. "Any three of the associates mentioned in the first section, are hereby authorized and empowered to call the first meeting of said corporation, by written notification to said associates herein mentioned."

Sec. 8. "This act shall take effect from and after its passage."

Sec. 9. "A director of the corporation shall not be personally liable to the corporation or its members for monetary damages for breach of the director's duty as a director, except for liability (i) for any breach of the director's duty of loyalty to the corporation or its members, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of the law, or (iii) for any

Filing Fee $10.00

State of Rhode Island and Providence Plantations
NON-PROFIT CORPORATION

DUPLICATE ORIGINAL OF
RESTATED ARTICLES OF INCORPORATION

OF

THE MIRIAM HOSPITAL

Pursuant to the provisions of Section 7-6-42 of the General Laws, 1956, as amended, the undersigned corporation executes the following Restated Articles of Incorporation for the purpose of restating its Articles of Incorporation as amended in a single instrument:

FIRST: The name of the corporation is The Miriam Hospital.

SECOND: The period of its duration is perpetual.

THIRD: The purpose or purposes which the corporation is authorized to pursue are: To organize, erect, acquire, equip, transact and maintain a hospital for the sick, disabled, and injured.

FOURTH: Any other provisions not inconsistent with law which are presently set forth in the Articles of Incorporation as heretofore amended, are as follows:

(If there are no other such provisions, so state.)

Section 1. "Betty Woolf, Walter I. Sundlun, Ethel Cutler, Isaac Gerber, Mary D. Grant, Alter Boyman, Theresa Feldman, Charles C. Brown, Sarah Payton, Max L. Grant, Lucy Black, Rose Siegel, Laura Klemer and Fannie L. Brown and their associates who may hereafter be admitted members of the corporation hereinafter created, according to the by-laws thereof, whether such members be individuals, corporations or other entities, are incorporated and made a body corporate by the name and style of The Miriam Hospital and by that name and style shall have perpetual succession, for the purpose of organizing, erecting, acquiring, equipping, transacting and maintaining a hospital and in connection therewith a training school for nurses for the sick, disabled and injured in the city of Providence, state of Rhode Island."

Sec. 2. "The said corporation, for the purpose of carrying into full effect its charitable and humane intentions, may take,

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transaction from which the director derived an improper personal benefit. If the Rhode Island Non-Profit Corporation Act is amended to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the corporation shall be eliminated or limited to the fullest extent permitted by the Rhode Island Non-Profit Corporation Act, as so amended. Any repeal or modification of the provisions of this Article by the corporation shall not adversely affect any right or protection of a director of the corporation existing at the time of such repeal or modification."

FIFTH: These Restated Articles of Incorporation correctly set forth without change the corresponding provisions of the Articles of Incorporation as heretofore amended, have been duly adopted as required by law, and supersede the Original Articles of Incorporation and all amendments thereto.

Dated 8/8, 1994

THE MIRIAM HOSPITAL

By: _____

Its _____President

and _____

Its _____Secretary

72535

BY-LAWS

THE MIRIAM HOSPITAL

Approved: July 26, 1994

Effective: August 9, 1994

Amended: August 14, 2001
August 10, 2004

TABLE OF CONTENTS

AMENDED AND RESTATED

BY-LAWS

THE MIRIAM HOSPITAL

ARTICLE I.

GENERAL

Section 1. Principal Office. The principal office of The Miriam Hospital (the "Hospital") shall be located in Providence, Rhode Island.

Section 2. Purpose. The Hospital shall at all times be operated exclusively as a tax-exempt charitable hospital and, as such, shall dispense medical and surgical aid and care to the sick and disabled of any race, creed or color in keeping with Jewish ethical aspirations, shall act in a fashion designed to further, improve and advance the science or art of health care delivery, patient care, and the knowledge, practice and teaching of medicine and nursing, assist in the advancement of medical research and investigation and in the improvement of medical teaching facilities and methods, shall promote the charitable, scientific and educational purposes of Lifespan Corporation, a nonprofit corporation organized and existing under the Rhode Island Nonprofit Corporation Act, and each of the corporations and other entities that may be directly or indirectly affiliated with Lifespan Corporation from time to time in an integrated, regional system for the delivery of comprehensive health services, and shall do all things incidental to and designed to promote the foregoing purposes and may engage in any other activity for which corporations may be organized under the Rhode Island Non-Profit Corporation Act. In carrying out the foregoing purposes, the Hospital shall receive the support of and maintain a close and continuous working relationship with (a) The Miriam Hospital Foundation, a Rhode Island non-profit corporation, and (b) Lifespan Corporation, and all of its affiliated entities.

Section 3. Gender and Trustee References. As used in these By-Laws, the pronoun "he" or "his," when appropriate, shall be construed to mean also "she" or "her." Throughout these By-

Laws, the directors of the Hospital shall be referred to as "Trustees" and the board of directors of the Hospital as "Board of Trustees."

ARTICLE II.

MEMBERSHIP

Section 1. Sole Member. The sole voting member of the Hospital shall be Lifespan Corporation, a nonprofit corporation organized and existing under the Rhode Island Nonprofit Corporation Act (the "Member").

Section 2. Powers and Duties. In addition to its other responsibilities established by law, the Act of Incorporation and these By-Laws, the Member shall have the following reserved powers:

A. The power to plan, direct and establish policy to assure the development and delivery of quality health services, professional education and biomedical research by the Hospital on an integrated, cost-effective basis with each other organization directly or indirectly owned or controlled by the Member from time to time and in furtherance thereof to have and exercise the following powers;

B. The power to establish and maintain accounting policies for the Hospital and appoint its outside auditors and the power to exercise general oversight responsibility for the financial affairs of the Hospital;

C. The power to negotiate, develop and approve all managed care products for the Hospital;

D. The power to negotiate, develop and approve affiliation agreements for education and research between Brown Medical School or other academic institutions and the Hospital;

E. The power to develop and approve human resource plans for the Hospital, including executive compensation and benefits plans;

F. The power to authorize (1) the amendment and restatement of articles of incorporation or other charter documents and of the By-Laws of the Hospital; (2)

the merger or consolidation of the Hospital with any other entity; (3) the sale, lease, exchange, mortgage, pledge or other disposition of all or substantially all the property and assets (with the exception, in accordance with Article IV, Section 1, of donor-restricted assets) of the Hospital; and (4) the voluntary dissolution of the Hospital, the plan of distribution of assets upon dissolution and revocation of voluntary dissolution proceedings;

G. The power to approve (1) the Hospital's strategic plans, and (2) proposed changes to its mission statement;

H. The power to approve the Hospital's (1) capital budgets, (2) operating budgets, and (3) non-budgeted material expenditures (as "material" is established by the Member's Board of Directors from time to time);

I. The power to approve the establishment by the Hospital of a new or additional location for the delivery of health care services;

J. The power to authorize the Hospital's participation in a joint venture, consolidation, network, association, system or alliance of health care providers;

K. The power to authorize the Hospital's organization or formation of a new subsidiary or joint venture in which the Hospital's ownership interest will be equal to or in excess of fifty (50) percent of net income or voting interest;

L. The power to authorize the Hospital's incurrence or guarantee of material indebtedness to any other person (as "material" is established by the Member's Board of Directors from time to time) and a mortgage, pledge or grant of a security interest in, property or assets of a hospital or related entity in connection with any such indebtedness;

M. The power to approve the Hospital's investment policies;

N. The power to elect or approve and remove the Chair, the Vice Chair, the Treasurer and the Secretary and the members of the Hospital's Board of Trustees; and

O. The power to authorize any vote by the Hospital of its capital stock or membership voting rights in any and all of its subsidiaries or affiliates with respect to any of the foregoing.

In the case of any conflict between the foregoing provisions of this Section 2 and any other provision of these By-Laws, the foregoing provisions of this Section 2 shall apply.

Section 3. Annual Meeting. The annual meeting of the Hospital for the transaction of such business by the Member as may properly come before the meeting shall be held in each year on such date and at such time as the Member or the Board of Trustees may from time to time determine. If the day fixed for the annual meeting shall be a legal holiday in the State of Rhode Island, such meeting shall be held on the next succeeding business day.

Section 4. Special Meetings. Special meetings of the Member may be called by the Chair of the Board of Trustees of the Hospital and shall be called by the Chair at the written request of the Member.

Section 5. Place of Meeting. The annual meeting of the Hospital and any special meetings of the Member shall take place at such location, either within or without the State of Rhode Island, as may be designated in the notice of the meeting. If no designation is made for the annual or special meeting, the place of meeting shall be at the Hospital.

Section 6. Notice of Meeting. Written notice stating the place, day and hour and, in the case of a special meeting, the purpose or purposes for which the meeting is called, shall be delivered to the Member not less than ten (10) nor more than sixty (60) days before the date of the meeting and shall be deemed delivered either when personally delivered, when given by facsimile or other electronic means (provided that the electronic means allows for confirmation of receipt), or when deposited in the United States mail with postage prepaid; provided, however, the Chair, in an emergency, may call a special meeting upon whatever notice is deemed reasonable by the Chair.

Section 7. Voting. At the annual meeting of the Hospital and at each meeting of the Member only the Member shall be entitled to vote. The Member may vote through its president

or other duly authorized officer either in person or by written proxy dated not more than three months before the meeting and filed with the Secretary of the Hospital.

Section 8. Action by Member Without Meeting. Any action which may be taken at a meeting of the Member may be taken without a meeting if a consent in writing, setting forth the action so taken, shall be signed by the Member with respect to the subject matter thereof.

ARTICLE III.

GOVERNORS

Section 1. General Power. The Governors shall serve as special advisors to the Board of Trustees and administration of the Hospital. In particular, the Governors shall (a) provide counsel on matters brought to their attention by the President or the Chair; (b) act as good-will ambassadors within the communities served by the Hospital; (c) assist the Hospital in obtaining the understanding and support of its constituencies; (d) highlight the importance of the Hospital's mission to the local community; (e) identify potential supporters of the Hospital; (f) make recommendations, as appropriate or when requested, to the Board of Trustees; and (g) approve for election by the Member the persons for the various positions as set forth in Section 4 below, subject to the limitations, if any, set forth in such Section 4 where any such nomination is not elected or approved by the Member.

Section 2. Number. The Governors of the Hospital shall consist of the following: (a) not more than thirty-five (35) persons interested in the goals and purposes of the Hospital and who desire to participate in its activities (the "Elected Governors"), (b) all Life Governors, as hereinafter defined, (c) all past Chairs of the Hospital, (d) the presiding lay officer of the Jewish Federation of Rhode Island, (e) (i) the president, or, if more than one, a Presiding Officer, and (ii) one additional representative of the Miriam Hospital Women's Association, (f) one (1) representative from the Rhode Island Rabbinical Association, (g) the Chair, Vice Chair, President, Treasurer and Secretary of the Hospital and (h) not more than five (5) additional persons appointed by the Chair (said five (5) additional persons are referred to as the "Appointed Governors").

Section 3. Tenure and Election. (a) Each Elected Governor shall serve for a term of two (2) years and until his/her successor shall have been elected and qualified. The terms of Elected Governors shall be staggered, such that the terms of approximately one half of the Elected Governors shall expire annually. No person who has served as an Elected Governor for three (3) consecutive two (2) year terms at the end of the then current year shall be eligible for re-election.

(b) Each Appointed Governor shall serve for a term of one (1) year and until his/her successor shall have been elected and qualified.

Section 4. Annual Meeting. The Governors shall meet at the annual meeting of the Hospital for the purpose of (a) electing Elected Governors and, from nominations received from the Chair, the members of the Nominating Committee of the Hospital, (b) approving and submitting to the Member for ratification and election the names of those persons nominated by the Nominating Committee to serve on the Board of Trustees (c) from among the names of those persons nominated by the Nominating Committee to serve on the Board of Trustees, approving and submitting to the Member for ratification and election the names of those persons nominated by the Nominating Committee to serve as Chair, Vice Chair, Treasurer and Secretary, and (d) transacting any other business as may come before the meeting. If the Member fails to elect the name of any person submitted to it for election pursuant to the provisions of this Section 4, then the Board of Trustees of the Hospital, and not the Governors, shall be responsible for nominating and submitting to the Member the name of another person to replace the name so rejected until the name so submitted shall have been elected by the Member. If the day fixed for the annual meeting shall be a legal holiday in the State of Rhode Island, such meeting shall be held on the next succeeding business day.

Section 5. Special Meetings. Special meetings of the Governors may be called by the Chair of the Hospital and shall be called by the Chair at the written request of at least one third (1/3) of the total number of Governors.

Section 6. Place of Meetings. The annual meeting and any special meetings of the Governors shall take place at such location, either within or without the State of Rhode Island, as

may be designated in the notice of the meeting. If no designation is made for the annual or special meeting, the place of meeting shall be at the Hospital.

Section 7. Notice of Meeting. Written notice stating the place, day, and hour and, in case of a special meeting, the purpose or purposes for which the meeting is called, shall be delivered to the Governors not less than ten (10) days nor more than sixty (60) days before the date of the meeting and shall be deemed delivered when personally delivered, when given by facsimile or other electronic means (provided that the electronic means allows for confirmation of receipt), or when deposited in the United States mail with postage prepaid; provided, however, the Chair, in an emergency, may call a special meeting upon whatever notice is deemed reasonable by the Chair.

Section 8. Quorum. Twenty (20) Governors shall constitute a quorum for the transaction of business at the annual meeting and all special meetings of Governors.

Section 9. Voting. Each Governor shall be entitled to one vote on each matter submitted to a vote of the Governors. The vote of a majority of the Governors in attendance at a meeting at which a quorum is present shall be the action of the Governors.

Section 10. Life Governors. Life Governors shall be those persons who have served at least fifteen (15) years as Governors, Trustees, or a combination of both, of the Hospital, and who have been appointed by the Chair of the Hospital to serve as Life Governors.

Section 11. Removal by Governors. The Governors may remove, with or without cause, at any time, any person whom the Governors have elected. The vote of the Governors to remove a person from office shall be by the affirmative vote of the same proportion of Governors which was required to elect such person in the first instance.

ARTICLE IV.

BOARD OF TRUSTEES

Section 1. General Powers. In addition to the duties and authority specifically delegated to the Board of Trustees elsewhere in these By-Laws, the Board of Trustees shall manage the property, affairs and business of the Hospital and shall have, and may exercise, all of the powers

of the Hospital, except those powers which are conferred by law, the Act of Incorporation or these By-Laws upon the Member. Notwithstanding any provision hereof to the contrary, the disposition of the donor-restricted assets of the Hospital shall remain at all times under the exclusive direction and control of the Board of Trustees of the Hospital.

Section 2. Number and Election. The number of trustees of the Hospital shall be determined from time to time by resolution of the Member. In the absence of a contrary resolution, the number of trustees, exclusive of ex officio and appointed members, shall be sixteen (16) and such trustees shall be elected by the Member after following the procedure for nominating trustees set forth in Section 4 of Article III herein. The Chair of the Hospital Board may appoint one (1) trustee for a term of one year. In addition, the President of the Hospital, the president of The Miriam Hospital Medical Staff, and the Chair of the Miriam Hospital Foundation Board of Trustees shall be ex officio voting members of the Hospital's Board of Trustees, and both the chair and the president of the Member shall be ex officio nonvoting members of the Hospital's Board of Trustees.

Section 3. Classes and Terms. (a) General. The elected Trustees of the Hospital shall be classified, with respect to the time for which they severally hold office, into three (3) classes, as nearly equal in number as possible, with each class to hold office until its successors are duly elected and qualified. At the 2004 annual meeting of the Hospital, approximately one-third of the elected members of the board of trustees shall be elected to serve a one-year term, one-third of the elected members of the board of trustees shall be elected to serve a two-year term, and one-third of the elected members of the board of trustees shall be elected to serve a three-year term. Thereafter, at each annual meeting of the Hospital the number of Trustees equal to the number of the class whose term expires at the time of such meeting shall be elected to hold office until the third succeeding annual meeting of the Hospital. Nominations of persons for election to each class of Trustees shall be made as set forth in Article VI, Section 5 hereof. (b) Term Limits. No person may serve on the Board of Trustees for more than three consecutive terms; provided that (i) no period of service prior to calendar year 2000 shall count toward a trustee's term limit; (ii)

any Trustee appointed in the middle of a term to fill a newly-created trusteeship shall be deemed to be serving in his or her first term; (iii) service on the Board of Trustees ex officio shall not be counted toward such maximum term; (iv) the Chair of the Board may serve beyond the maximum term in order to continue his or her service as Chair for up to five (5) consecutive years in that position; and (v) a Trustee may be elected for an additional period, not to exceed one year, beyond the completion of three consecutive terms if the Nominating Committee finds that extraordinary circumstances exist and that discontinuance of said Trustee's appointment would be deleterious to the Hospital, in which case the Member may extend the term of one such Trustee who shall serve in addition to the maximum number of Trustees specified in Article IV, Section 2 of these By-Laws.

Section 4. Annual Meeting. There shall be an annual meeting of the Board of Trustees to be held immediately after the close of the annual meeting of the Hospital. No notice thereof shall be required. At the annual meeting, the trustees shall transact such business as may properly come before the meeting.

Section 5. Regular Meetings. Regular meetings of the Board of Trustees shall be held at The Miriam Hospital on the fourth Tuesday of each month or at such other place and time as the Board shall from time to time determine by vote. Notice of regular meetings need not be given.

Section 6. Special Meetings. Special meetings of the Board of Trustees may be called by or at the request of the Chair or any three (3) trustees. Any such meeting may be held by means of a telephone conference circuit or similar communication equipment and connection to such circuit shall constitute presence at such meeting.

Section 7. Notice. Notice of any special meeting of the Board of Trustees shall be given at least five (5) days prior to the date thereof and shall designate the date, time, and location for the meeting; provided, however, the Chair, in an emergency, may call a special meeting upon whatever notice is deemed reasonable by the Chair. The notice shall be deemed delivered when personally delivered, when given by facsimile or other electronic means (provided that the electronic means allows for confirmation of receipt), or when deposited in the United States mail

with postage prepaid. Neither the business to be transacted at, nor the purpose of, any meeting of the Board of Trustees need be specified in the notice of such meeting.

Section 8. Quorum. A majority of the number of trustees fixed pursuant to Section 2 of this Article IV who are entitled to vote shall constitute a quorum for the transaction of business at any meeting of the Board of Trustees.

Section 9. Voting. The vote of a majority of the trustees in attendance at a meeting at which a quorum is present and who are entitled to vote shall be the act of the Board of Trustees.

Section 10. Action by Trustees Without Meeting. Any action which may be taken at a meeting of the Board of Trustees may be taken without a meeting if a consent in writing, setting forth the action so taken, shall be signed by all of the trustees entitled to vote with respect to the subject thereof.

Section 11. Removal of Trustees. Any trustee may be removed with or without cause by the Member.

Section 12. Vacancies. Notwithstanding the procedure for nominating trustees set forth in Section 4 of Article III, any vacancy occurring on the Board of Trustees shall be filled by a person nominated by the affirmative vote of a majority of the remaining trustees, if any, entitled to vote and elected by the Member. A person elected to fill a vacancy on the Board of Trustees shall serve until the expiration of the vacating trustee's term, at which time the vacancy shall be filled by the nomination procedure for trustees set forth in such Section 4 of Article III.

ARTICLE V.

OFFICERS

Section 1. Officers. The officers of the Hospital shall be a Chair, a Vice Chair, a Treasurer, a Secretary and a President.

Section 2. Election and Tenure of Office. The Chair, Vice Chair, Treasurer and Secretary shall be elected by the Member after following the procedure for nominating such officers set forth in Section 4 of Article III herein. Each such officer shall serve for a term of one year and until his/her successor is elected and qualified. No officer, other than the President,

shall serve in the same office for more than five (5) consecutive years. Notwithstanding the foregoing, any period of service prior to calendar year 2000 shall not count toward an officer's five-year limit. The President shall be appointed by the president of the Member in consultation with the board of directors of the Member and the Board of Trustees of the Hospital, and his/her term shall be as described in Section 8 following. All officers of the Hospital other than the Chair, Vice Chair, Treasurer, Secretary and President shall be deemed administrative officers and shall be appointed and removed in the manner provided for in Article VII of the By-Laws.

Section 3. Duties of Chair. In addition to the duties and authority specifically delegated to the Chair elsewhere in these By-Laws, the Chair of the Hospital shall (a) preside at all meetings of the Governors and trustees, (b) report in writing at the annual meeting of the Member on the condition of affairs at the Hospital and make recommendations with respect thereto, (c) nominate annually for election by the Governors persons to serve on the Hospital's Nominating Committee, and (d) perform such other duties as the Board of Trustees may prescribe from time to time.

Section 4. Duties of Vice Chair. In the absence or inability of the Chair to act, the Vice Chair shall have the powers and perform all of the duties of the Chair; provided, however, in the event that the office of Chair is vacant, the Vice Chair shall not automatically succeed to the office of Chair. The Vice Chair shall have such other powers and perform such other duties as the Board of Trustees may prescribe from time to time.

Section 5. Duties of Treasurer. The Treasurer shall have the responsibility to ensure the safekeeping of all Hospital funds. Acting with the Board of Trustees and the Miriam Hospital Finance Committee, the Treasurer shall ensure that a true and accurate accounting of the financial transactions of the Hospital is made and that reports of such transactions are presented to the Board of Trustees. The Treasurer shall also perform such other duties as the Board of Trustees may prescribe from time to time.

Section 6. Duties of Secretary. The Secretary shall issue notices for and keep minutes of all meetings of the Board of Trustees, shall have charge of the corporate seal and corporate

books, and shall make such reports and perform such other duties as are incident to the office of Secretary or required by the Board of Trustees.

Section 7. Duties of President. The President shall be the chief executive officer of the Hospital and, in that capacity, shall in general supervise, manage and control all of the business and affairs of the Hospital, including the planning of hospital services and the development and recommendation of the Hospital's budget, subject to the provisions of the By-Laws and the direction of the Board of Trustees, and perform all duties incident to the office of President and such other duties as may be prescribed by these By-Laws and the Board of Trustees from time to time and shall report to the president of the Member. The President's performance will be evaluated annually by the president of the Member with the advice and consultation of the Chair of the Hospital.

Section 8. Removal of Chair, Vice Chair, Treasurer, Secretary and President. The Chair, Vice Chair, Treasurer and Secretary of the Hospital may be removed by the Member at any time, either with or without cause. The President of the Hospital shall serve at the pleasure of the president of the Member and may be removed only by the president of the Member in consultation with the board of directors of the Member and the Board of Trustees of the Hospital.

Section 9. Vacancies. Notwithstanding the procedure for nominating the Chair, Vice Chair, Treasurer and Secretary of the Hospital set forth in Section 4 of Article III, any vacancy occurring in any such office shall be filled by a person nominated by the affirmative vote of a majority of the trustees entitled to vote and elected by the Member. A person elected to fill a vacancy in any such office shall serve until the next annual meeting of the Hospital, at which time the vacancy shall be filled by the nomination procedure for officers set forth in such Section 4 of Article III.

ARTICLE VI.

COMMITTEES

Section 1. Standing Committees. The Standing Committees of the Hospital shall be a Professional and Academic Affairs Committee, a Finance Committee, and a Nominating

Committee. The Chair and the President of the Hospital shall be ex officio voting members of the Standing Committees, with the exception of the Nominating Committee, on which they shall serve as ex officio non-voting members.

Section 2. Other Committees. The Chair may appoint, subject to the approval of the Board of Trustees, such other committees as may from time to time be deemed suitable, necessary, or convenient to aid in accomplishing the purposes of the Hospital. The duties and powers of any such committee and the term of office of its members shall be prescribed by the Board of Trustees. The Chair, thereafter, shall appoint persons to serve on the committees so constituted. The Chair of the Board of Trustees shall appoint the Chair and Vice-Chair of each such committee, and each Committee Chair shall be an elected member of the Board of Trustees. The Chair and President of the Hospital shall be ex officio members of all such committees. At least one representative of the Medical Staff will be a member of any committee that deliberates issues affecting the discharge of Medical Staff responsibilities.

Section 3. Professional and Academic Affairs Committee. The Professional and Academic Affairs Committee shall be comprised of the President and Vice President of the Medical Staff, the Chiefs of Medicine and Surgery and such other persons appointed by the Chair of the Board of Trustees. The Committee shall be responsible for making recommendations on medical staff appointments and reappointments, acting as liaison to the Medical Staff on matters of major policy, overseeing the Quality, Utilization and Risk Management programs and the teaching and research programs, including affiliations with Brown and other institutions of higher learning. The Chair of the Board of Trustees shall appoint the Chair and Vice-Chair of the Committee, and the Committee Chair shall be an elected member of the Board of Trustees.

Section 4. Finance Committee. The Finance Committee shall be comprised of those persons appointed by the Chair of the Board of Trustees of the Hospital. The Committee shall be responsible for reviewing and recommending to the Board of Trustees of the Hospital, for submission to the Member for approval, the annual operating and capital budgets, as well as reviewing monthly statistics and financial reports, business plans, certification of need ("CON")

applications, and the financial policies, procedures and plans, including capital financing, each as may be subject to the reserved powers of the Member in accordance with Article II, Section 2 herein. In addition, the Committee shall meet quarterly with the finance committee of Rhode Island Hospital to review and discuss matters of mutual interest such as bondholder reports and budgetary matters. The Chair shall appoint the Chair and Vice Chair, if any, of the Committee, each of whom shall be an elected member of the Hospital Board.

Section 5. Nominating Committee. (a) Composition. The Nominating Committee shall be comprised of five (5) Governors or Trustees, elected by the Governors at their annual meeting from nominations received from the Chair. The Governors shall designate a chair of the Committee from among those elected to serve as Committee members. (b) Governors. The Committee shall be responsible for evaluating the performance of the Governors including those who have completed their terms and are eligible for re-election. Such evaluation shall include, but not be limited to, attendance at meetings and participation in committee activities. The Committee shall explain the obligations of Governorship to potential nominees in order to have nominees make an informed decision about their ability to serve. The Committee shall consider individuals for nomination who represent diverse community interests and backgrounds and have talents or skills in such areas as planning, business and finance, community relations, health care, education and governance which will add to the governance process of the Hospital. The Committee shall be responsible for certifying to the Secretary of the Hospital thirty (30) days in advance of the annual meeting of the Hospital its selections for each Elected Governor position due to expire which is to be filled by the Governors at the annual meeting of Governors. (c) Trustees. The Committee shall be responsible for identifying members of the community who can effectively serve as trustees of the Hospital. The Committee shall strive to ensure that the composition of the Board represents diverse community constituencies and provides the necessary areas of expertise. In addition, the Committee shall develop and monitor trustee orientation and ongoing education programs. The Committee shall be responsible for certifying to the Secretary of the Hospital thirty (30) days in advance of the annual meeting of the Hospital

its selections for each Trustee position due to expire, which shall include both the name of each nominee and the class of Trustees to which he or she has been nominated to serve. (d) Officers. The Committee shall be responsible for nominating persons to serve as officers of the Hospital, other than that of the President and those administrative offices which are filled by the President pursuant to Article VII of these By-Laws. The Committee shall certify to the Secretary of the Hospital thirty (30) days in advance of the annual meeting of the Hospital its selections for each such officer position due to expire.

Section 6. Quorum. A majority of the number of committee members shall constitute a quorum for the transaction of business at any meeting of a committee.

Section 7. Record of Meetings. A written summary of all actions taken at each committee meeting shall be prepared and submitted to the Board of Trustees.

ARTICLE VII.

ADMINISTRATIVE OFFICES

Section 1. Administrative Offices. Subject to the approval by the Board of Trustees, the President may create such administrative offices as he deems necessary. Following approval of such offices by the Board of Trustees, the President may appoint such individuals as he deems fit to serve in such capacities and the President may remove such individuals in his/her discretion at any time.

ARTICLE VIII.

INDEMNIFICATION

Section 1. Indemnification of Governors, Non-Employee Officers, Trustees and Members of Committees. The Hospital shall indemnify to the fullest extent permitted under Rhode Island General Laws § 7-6-6, as amended from time to time, or any other applicable law related or succeeding thereto then in effect every Governor, trustee, non-employee officer or member of a committee of the Hospital made a party to a proceeding by reason of such person being or having been a Governor, trustee, non-employee officer, or member of a committee of the Hospital against judgments, penalties, fines, settlements and reasonable expenses actually

incurred, including those expenses actually incurred prior to the final disposition of such proceeding, subject to the limitations, if any, contained in Rhode Island General Laws § 7-6-6, as amended from time to time, or in any other applicable law related or succeeding thereto then in effect.

Section 2. Indemnification of Employees. The Hospital may indemnify to the fullest extent permitted under Rhode Island General Laws § 7-6-6, as amended from time to time, or any other applicable law related or succeeding thereto then in effect, any employee made a party to a proceeding by reason of such person being or having been an employee of the Hospital against judgments, penalties, fines, settlements and reasonable expenses actually incurred, including those expenses actually incurred prior to the final disposition of such proceeding, subject to the limitations, if any, contained in Rhode Island General Laws § 7-6-6, as amended from time to time, or in any other applicable law related or succeeding thereto then in effect; provided, however, if such employee is made a party to a proceeding by reason of also being or having been a Governor, non-employee officer, trustee or member of a committee of the Hospital, then the Hospital shall indemnify the employee against those judgments, penalties, fines, settlements and reasonable expenses actually incurred in connection with such employee's service as a Governor, non-employee officer, trustee or member of a committee of the Hospital in accordance with Section VIII.1 above and the Hospital may indemnify the employee against those judgments, penalties, fines, settlements and reasonable expenses actually incurred in connection with such employee's service as an employee.

ARTICLE IX.

CONFLICT OF INTEREST

Any contract or other transaction between the Hospital and one or more of its trustees, Governors, officers, members of a committee of the Hospital or members of the Medical Staff or between the Hospital and any other corporation, firm or association in which one or more of its trustees, Governors, officers, members of a committee of the Hospital or members of the Medical Staff of the Hospital are officers or trustees or have a financial interest shall be voidable unless

(1) at a meeting of the Board of Trustees or committee authorizing or ratifying the contract or transaction there is a quorum of persons not so interested and the contract or other transaction is approved by a majority of such quorum, or (2) the contract or other transaction is ratified by the Member, or (3) the contract or other transaction is just and reasonable to the Hospital at the time it is made, authorized or ratified.

ARTICLE X.

MEDICAL STAFF

Section 1. Organization. There shall be an organization known as The Miriam Hospital Medical Staff comprised of physicians, dentists, podiatrists and other doctoral level professionals appointed to the Medical Staff in accordance with The Miriam Hospital Medical Staff Association By-Laws. The Board of Trustees of the Hospital shall assign to the Medical Staff reasonable authority for ensuring that one level of appropriate professional care is provided to all patients only by a member of the Medical Staff with admitting privileges. In furtherance of the foregoing, the Board of Trustees shall consider the recommendations of the Medical Staff and appoint to the Medical Staff, in numbers not exceeding the Hospital's needs, physicians and others who meet the qualifications for membership of the Medical Staff. The governance, administration and qualifications for membership in the Medical Staff shall be set forth in By-Laws, rules, regulations and amendments thereto; provided, however, all such By-Laws, rules, regulations and amendments shall be subject to the approval of the Board of Trustees of the Hospital.

Section 2. Authority. The Medical Staff shall (a) conduct an ongoing review and appraisal of the quality of professional care rendered at the Hospital and shall report such activities and their results to the Board of Trustees of the Hospital, (b) make recommendations to the Board of Trustees of the Hospital concerning (i) appointments, reappointments and other changes in staff status, (ii) granting of clinical privileges, (iii) disciplinary actions, (iv) and all matters relating to professional competence, and (c) perform such other duties as may be prescribed from time to time by the Board of Trustees of the Hospital.

ARTICLE XI.

WOMEN'S ASSOCIATION

There shall be an organization known as The Miriam Hospital Women's Association comprised of individuals who are interested in the purpose and goals of the Hospital and desire to participate in activities which benefit and support the Hospital. The governance, administration and qualifications for membership in The Miriam Hospital Women's Association shall be set forth in their By-Laws which shall be subject to the approval of the Board of Trustees of the Hospital.

ARTICLE XII.

AMENDMENTS

These By-Laws may be altered, amended or repealed by the Member at any annual or special meeting, notice of which shall specify the subject matter of the proposed alteration, amendment or repeal of the sections to be affected thereby, by vote of the Member and these By-Laws may be altered, amended or repealed at any annual or special meeting of the Governors, notice of which shall specify the subject matter of the proposed alteration, amendment or repeal of the sections to be affected thereby, by vote of the Governors, which vote, in order to be effective, shall be subject to ratification by the Member.

3

Question 30 (D) Throughput & Utilization

	Med/Surg			Whole Hospital		
	Potential	Actual	Percent	Potential	Actual	Percent
Measured in	Patient Days			Patient Days		
Previous 3 Years:						
FY 2003	63,145	55,814	88.4%	75,920	66,199	87.2%
FY 2004	63,318	59,628	94.2%	76,128	69,721	91.6%
FY 2005	67,890	61,798	91.0%	80,665	72,346	89.7%
Current Year:						
FY 2006	69,178	61,528	88.9%	81,953	72,416	88.4%
3 Years post-implementation:						
FY 2007	73,000	61,464	84.2%	85,775	72,352	84.4%
FY 2008-1st full year	75,396	61,560	81.6%	88,206	72,448	82.1%
FY 2009	77,380	61,599	79.6%	90,155	72,487	80.4%
FY 2010	77,380	64,891	83.9%	90,155	75,779	84.1%

Question 41 (A) Capital Expenditures ($ in 000s)

	Grand Total	
	Amount	Percent
Surveys / studies		
Fees / permits		
Architect		
subtotal soft construction cost		
Site preparation		
Demolition		
Renovation	10	0.58%
New construction		
Contingency		
subtotal hard construction cost	10	0.58%
Furnishings		
Movable equipment		
Fixed equipment	1,700	99.06%
subtotal equipment cost	1,700	99.06%
subtotal construction cost	1,710	99.64%
Lease expense		
Capitalized interest		
Bond Cost / insurance		
Debt reserve fund		
Accounting / legal		
Financing fees		
subtotal financing cost		
Land		
CON application fee (Total Capital Costs x .0033) + $500	6	0.36%
Other (specifiy)		
Grand Total	$ 1,716	100.00%

Disclaimer - Columns, rows and totals from one page to another may not foot due to rounding errors.

Question 41 (B) Capital Expense Cost Analysis ($ in 000s)

1) Financial Plan

Funding for capital costs will be provided by the existing plant fund. Incremental expenses will be funded by revenues from incremental volume.

2) Relationship of project cost to total facility cost

	Project	Facility	Percent
Capital	$ 1,716	$ 310,812	0.6%
Operating	$ 893	$ 296,321	0.3%

3) Estimate of capital cost inflation and impact on implementation

The cost of capital includes no estimate for inflation because the cost is secured by a quote from the vendor. In the event some adjustment to the cost due to inflation is required, it is expected to be minimal considering the timeframe in which this proposal is anticipated to be become operational and therefore will have no impact on implementation.

Disclaimer - Columns, rows and totals from one page to another may not foot due to rounding errors.

Question 42 Financing Mix ($ in 000s)

Grand Total:	Amount	Percent	Interest Rate	Term (years)
Equity	$ 1,716	100.00%		
Debt				
Lease				
Grand total	$ 1,716	100.00%		

Question 47 Depreciation & Amortization (Straight - Line Method) ($ in 000s)

Grand Total:	Buildings & Improvements	Equipment		Amortization	Total
		Fixed	Moveable		
Total cost	$ 10	$ -	$ 1,700	$ 6	$ 1,716
Less salvage value					
Amount to be depreciated	10		1,700	6	1,716
Average useful life	25		7	7	7
Annual depreciation expense	$ 0	$ -	$ 243	$ 1	$ 244

Question 48 Staffing (First Full Year of Operation - FY 2008) ($ in 000s)

	CON Denied		Additions / Reductions		CON Approved	
	Number of FTE's	Payroll w/ Fringe Benefits	Number of FTE's	Payroll w/ Fringe Benefits	Number of FTE's	Payroll w/ Fringe Benefits
Whole Hospital:						
Management	48.9	$ 7,218			48.9	$ 7,218
Professional / Tech	304.1	30,861			304.1	30,861
Nursing	519.2	58,808			519.2	58,808
Service / Maintenance	390.9	19,936			391.0	19,936
Office / Clerical	294.2	16,099			294.2	16,099
Physician / Resident	45.6	19,174			45.6	19,174
Total	1,603.0	$ 152,096			1,603.0	$ 152,096
Med/Surg:						
Management	4.9	$ 747			4.9	$ 747
Professional / Tech	0.6	53			0.6	53
Nursing	207.0	19,217			207.0	19,217
Service / Maintenance	41.5	1,869			41.5	1,869
Office / Clerical	35.8	1,703			35.8	1,703
Physician / Resident						
Total	289.8	$ 23,590			289.8	$ 23,590

Disclaimer - Columns, rows and totals from one page to another may not foot due to rounding errors.

Question 49 Statement of Operations ($ in 000s)

	Actual Previous Year FY 2005	Budgeted Current Year FY 2006	First Full Year of Operation (FY 2008) Con Denied	Con Approved	Difference
Whole Hospital:					
Net Patient Service Revenue	$ 261,048	$ 266,031	$ 285,878	$ 287,276	$ 1,398
Other Operating Revenue	10,046	10,372	10,679	10,679	
Total Net Revenue	271,094	276,403	296,557	297,955	1,398
Expenses:					
Compensation & Benefits	127,880	134,243	152,096	152,096	
Supplies	58,591	57,814	63,665	64,201	536
Other Controllable Expenses	46,851	47,701	49,946	49,946	
Total Controllable Expenses	233,322	239,758	265,706	266,242	536
Provision for Bad Debts	19,492	17,757	16,956	17,068	112
Depreciation	7,979	8,088	9,895	10,139	244
Total Other Expenses	27,471	25,845	26,851	27,207	357
Total Expenses	260,793	265,603	292,557	293,450	893
Income (Loss) from Operations	10,301	10,800	4,000	4,505	505
Other Income (Expense):					
Investment Income	7,500	3,855	2,135	2,135	
Interest Expense	(3,115)	(3,022)	(2,871)	(2,871)	
Other Gains (Losses)	26				
Total Other Income	4,411	833	(736)	(736)	
Net Income (Loss)	$ 14,712	$ 11,633	$ 3,263	$ 3,768	$ 505
Unit of Service :					
# Units of Service (Discharges)	13,504	13,368	12,747	12,867	120
NPSR per Discharge	$ 19,331	$ 19,901	$ 22,427	$ 22,326	$ (101)
Total Cost per Discharge	$ 19,543	$ 20,095	$ 23,176	$ 23,029	$ (147)
Med/Surg:					
Net Patient Service Revenue				$ 1,398	$ 1,398
Other Operating Revenue					
Total Net Revenue				1,398	1,398
Expenses:					
Compensation & Benefits	$ 21,494	$ 21,092	$ 23,590	23,590	
Supplies	1,419	1,432	1,519	1,519	536
Other Controllable Expenses	955	915	971	971	
Total Controllable Expenses	23,868	23,439	26,080	26,080	536
Provision for Bad Debts					112
Depreciation				244	244
Total Other Expenses				244	357
Total Expenses	23,868	23,439	26,080	26,324	893
Income (Loss) from Operations	(23,868)	(23,439)	(26,080)	(24,926)	505
Other Income (Expense):					
Investment Income					
Interest Expense					
Other Gains (Losses)					
Total Other Income					
Net Income (Loss)	$ (23,868)	$ (23,439)	$ (26,080)	$ (24,926)	$ 505
Unit of Service :					
# Units of Service (Discharges)	13,504	13,368	12,747	12,867	120
NPSR per Discharge	$ -	$ -	$ -	$ 109	$ 109
Total Cost per Discharge	$ 1,767	$ 1,753	$ 2,046	$ 2,046	$ (0)

Disclaimer - Columns, rows and totals from one page to another may not foot due to rounding errors.

Question 50 Payor Mix and Net Patient Revenue (First Year Full of Operation - FY 2008) ($ in 000s)

Total Hospital:

Based on Discharges	Utilization Number	Utilization Percent	Net Revenue/Unit of Service	Total NPSR	Bad Debt
CON Approved:					
Medicare	4,789	37.2%	$ 17,147	$ 82,113	
Medicaid	576	4.5%	16,348	9,422	
Commercial / HMO / BC	6,952	54.0%	27,681	192,446	
Self	16	0.1%	319,936	5,100	$ 17,068
Other	116	0.9%	(15,624)	(1,806)	
Charity	418	3.2%			
Total	12,867	100.0%	$ 22,326	$ 287,276	$ 17,068
CON Denied:					
Medicare	4,772	37.4%	$ 17,153	$ 81,848	
Medicaid	576	4.5%	16,348	9,422	
Commercial / HMO / BC	6,851	53.7%	27,918	191,275	
Self	15	0.1%	344,614	5,149	$ 16,956
Other	115	0.9%	(15,849)	(1,816)	
Charity	418	3.3%			
Total	12,747	100.0%	$ 22,427	$ 285,878	$ 16,956
Difference:					
Medicare	17	14.2%	$ 15,607	$ 265	
Medicaid					
Commercial / HMO / BC	101	84.2%	11,594	1,171	
Self	1	0.8%	(48,798)	(49)	$ 112
Other	1	0.8%	10,114	10	
Charity					
Total	120	100.0%	$ 11,647	$ 1,398	$ 112

Med/Surg:

Based on Discharges	Utilization Number	Utilization Percent	Net Revenue/Unit of Service	Total NPSR	Bad Debt
CON Approved:					
Medicare	17	14.2%	$ 15,607	$ 265	
Medicaid					
Commercial / HMO / BC	101	84.2%	11,594	1,171	
Self	1	0.8%	(48,798)	(49)	$ 112
Other	1	0.8%	10,114	10	
Charity					
Total	120	100.0%	$ 11,647	1,398	$ 112
CON Denied:					
Medicare					
Medicaid					
Commercial / HMO / BC					
Self					
Other					
Charity					
Total			$ -		$ -
Difference:					
Medicare	17	14.2%	$ 15,607	$ 265	
Medicaid					
Commercial / HMO / BC	101	84.2%	11,594	1,171	
Self	1	0.8%	(48,798)	(49)	$ 112
Other	1	0.8%	10,114	10	
Charity					
Total	120	100.0%	$ 11,647	1,398	$ 112

* Based on FY 2005 actual data, it is estimated that approximately 3% (418) of all (13,539) discharges have some amount written off as charity. The breakout of Self, Other and Charity are estimates based on ratios.

Disclaimer - Columns, rows and totals from one page to another may not foot due to rounding errors.

Question 51 Debt and Endowments ($ in 000s)

A) Debt	FY 2006
Current portion of LTD	$ 1,223
Long term debt	49,132
Total	$ 50,355

D) Endowments	Total	Restricted	Unrestricted
FY 2003	$ 74,130	$ 9,823	$ 64,307
FY 2004	83,477	11,586	71,891
FY 2005	95,600	13,612	81,988
FY 2006 YTD as of 4/30/06	105,148	14,524	90,624

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Question 64 Units of Service by Patient's Primary Source of Payment (FY 2005)

Primary Source of Payment	Number of Inpatient Discharges (1)	Number of Outpatient Visits	Number of Inpatient Days (1,2)
Medicare	5,048	22,090	28,469
Medicaid	580	4,790	3,602
Commercial /HMO/BC	7,290	66,897	33,632
Self	30	2,358	53
Other	138	1,691	484
Charity	418	1,253	2,115
Total	13,504	99,078	68,355

(1) excludes newborns

(2) In FY 2005, approximately 3% of all inpatient discharges had some amount of the account written off as charity care, ranging from 10% to 100% of charges, and approximately 1.1% of OP encounters had some amount of the account written off as charity care, also ranging from 10% to 100% of charges. Charity care days are estimated using the overall hospital ALOS.

Disclaimer - Columns, rows and totals from one page to another may not foot due to rounding errors.

4

Positive Margins (T2)

Radical Prostatectomy Series		% Positive margins
Guillonneau[1]	(Laparoscopic)	7.7%
Scardino[2]	(Open)	5.9%
Tewari[3]	(Robotic)	4.3%
Lee[4]	(Robotic)	6.0%
Locke[5]	(Robotic)	6.2%
Menon[6]	(Robotic)	6%
Ahlering[7]	(Robotic)	4.5%
Patel[8]	(Robotic)	5.7%

1. Touijer K, Kuroiwa K, Saranchuk JW, Hassen WA, Trabulsi EJ, Reuter VE, Guillonneau B. Quality improvement in laparoscopic radical prostatectomy for pT2 prostate cancer: impact of video documentation review on positive surgical margin. J Urol. 2005 Mar;173(3):765-8. p. 766 (Results) **2.** Scardino PT. Open Radical Retropubic Prostatectomy. Presented at the American Urological Association's *Carcinoma of the Prostate Course,* San Francisco, California, Sept. 30 – Oct. 1 2005 **3.** Tewari A, El-Hakim A, Leung RA. Robotic prostatectomy: a pooled analysis of published literature. Expert Rev Anticancer Ther. 2006 Jan;6(1):11-20. **4.** Lee DI. Margin Risk With Experience. Presented at UC Irivine's 2006 ART (Advanced Robotic Techniques) of Prostatectomy Symposium, January 5, 2006, Anaheim, California **5.** Locke DR, Klimberg IW, Sessions RP. Robotic Radical Prostatectomy With Continence And Potency Sparing Technique: An Analysis Of The First 250 Cases. Submitted To Journal Of Urology, Publication Date TBD. p. 4 Table 3. **6.** Menon M, Tewari A, Peabody JO, Shrivastava A, Kaul S, Bhandari A, Hemal AK. Vattikuti Institute prostatectomy, a technique of robotic radical prostatectomy for management of localized carcinoma of the prostate: experience of over 1100 cases. Urol Clin North Am. 2004 Nov;31(4):701-17. Review. **7.** Ahlering TE, Woo D, Eichel L, Lee DI, Edwards R, Skarecky DW. Robot-assisted versus open radical prostatectomy: a comparison of one surgeon's outcomes. Urology. 2004 May;63(5):819-22. p. 821 table III. **8.** Patel VR, Tully AS, Holmes R, Lindsay J. Robotic radical prostatectomy in the community setting--the learning curve and beyond: initial 200 cases. J Urol. 2005 Jul;174(1):269-72. p. 270 table 4.

Positive Margins (T2)

Radical Prostatectomy Series		% Positive margins
Guillonneau[1]	(Laparoscopic)	7.7%
Scardino[2]	(Open)	5.9%
Ahlering (last 83 patients)[3]	(Robotic)	2.7%
Patel (last 500 patients)[4]	(Robotic)	2-4%

1. Touijer K, Kuroiwa K, Saranchuk JW, Hassen WA, Trabulsi EJ, Reuter VE, Guillonneau B. Quality improvement in laparoscopic radical prostatectomy for pT2 prostate cancer: impact of video documentation review on positive surgical margin. J Urol. 2005 Mar;173(3):765-8. p. 766 (Results) **2.** Scardino PT. Open Radical Prostatectomy. Presented at the American Urological Association's *Carcinoma of the Prostate Course,* San Francisco, California, Sept. 30, 2005 **3.** T Ahlering. 3.0% positive margin for last 83 patients. Unpublished 2006 UCI Internal Data. Submitted to JOU for publication. **4.** VR Patel. Urology Centers, Vestavia Hills, USA. Histopathologic Outcomes and Short Term PSA Data after Robotic Radical Prostatectomy. 500 Patients. Moderated Poster Session MP27, Wednesday, August 24, 2005. 23rd World Congress on Endourology and SWL 21st Basic Research Symposium August 23-26, 2005, Amsterdam, The Netherlands. J Endourol. 2005 Aug.; 19, Supplement 1: A135.

Urinary Continence Outcomes

Surgeon		3 mo	6 mo	12 mo
Walsh[1]	(Open)	54 %	80%	93%
Guillonneau	(Laparoscopic)	N/A	N/A	89.2 %[2]
Rassweiler[3]	(Laparoscopic)	N/A	74%	97%
Menon[4]	(Robotic)	N/A	96%	N/A
Locke[5]	(Robotic)	92.9%	94.9%	97.4%
Ahlering[6]	(Robotic)	75%	N/A%	95%
Patel[7]	(Robotic)	82%	89%	98%

1. Walsh PC. Patient-reported urinary continence and sexual function after anatomic radical prostatectomy. J Urol. 2000 Jul;164(1):242. p. 59 table 1. **2.** Vallancien G, Guillonneau B, Cathelineau X, Baumert H, Doublet JD. [Localized prostatic cancer: treatment with laparoscopic radical prostatectomy: study with 841 cases] Bull Acad Natl Med. 2002;186(1):117-23; discussion 123-4. French. **3.** Rassweiler J, Sentker L, Seemann O, Hatzinger M, Rumpelt HJ. Laparoscopic radical prostatectomy with the Heilbronn technique: an analysis of the first 180 cases. J Urol. 2001 Dec;166(6):2101-8. **4.** Menon M, Tewari A; Vattikuti Institute Prostatectomy Team. Robotic radical prostatectomy and the Vattikuti Urology Institute technique: an interim analysis of results and technical points. Urology. 2003 Apr;61(4 Suppl 1):15-20. p.15 (abstract) **5.** Locke, DR, Klimberg IW and Sessions RP. Robotic Radical Prostatectomy With Continence And Potency Sparing Technique: An Analysis Of The First 250 Cases. Submitted To Journal Of Urology, Publication Date TBD. p. 5 table 4. **6.** T Ahlering. Continence: The UC Irvine Experience. Presented at UC Irivine's 2006 ART (Advanced Robotic Techniques) of Prostatectomy Symposium, January 5, 2006, Anaheim, California **7.** Patel VR, Tully AS, Holmes R, Lindsay J. Robotic radical prostatectomy in the community setting--the learning curve and beyond: initial 200 cases. J Urol. 2005 Jul;174(1):269-72. p. 270 table 3.

Sexual Potency Outcomes

Best Potency Outcomes	Walsh (2004)[1] N=25	UCI (2005)[2] N=27
Pre-op IIEF-5 >21	All	All
Average Age	X 50.1	55.7
Follow-up	12 mos.	12 mos.
Coitus	71 %	74 %
BNS	100%	14/18 (78%)
UNS	NA	4/9 (67%)
Post Radical Prostatectomy Average IIEF-5 Potent men score	15.7	[illegible]

1. Parsons JK, Marschke P, Maples P, Walsh PC. Effect of methylprednisolone on return of sexual function after nerve-sparing radical retropubic prostatectomy. Urology. 2004 Nov;64(5):987-90.

Sexual Potency Outcomes

Best Potency Outcomes	Walsh (2004)[1] N=25
Pre-op IIEF-5 >21	All
Average Age	X 50.1
Follow-up	12 mos.
Coitus	71 %
BNS	100%
Post Radical Prostatectomy Average IIEF-5 Potent men score	15.7

1. Parsons JK, Marschke P, Maples P, Walsh PC. Effect of methylprednisolone on return of sexual function after nerve-sparing radical retropubic prostatectomy. Urology. 2004 Nov;64(5):987-90. **2.** Menon M, Kaul S, Bhandari A, Shrivastava A, Tewari A, Hemal A. Potency following robotic radical prostatectomy: a questionnaire based analysis of outcomes after conventional nerve sparing and prostatic fascia sparing techniques. J Urol. 2005 Dec;174(6):2291-6, discussion 2296. p. 2293 fig. 2.

Robotic mitral valve surgery: A United States multicenter trial

L. Wiley Nifong, MD,[a] W. R. Chitwood, MD,[a] P. S. Pappas, MD,[b] C. R. Smith, MD,[c] M. Argenziano, MD,[c] V. A. Starnes, MD,[d] and P. M. Shah, MD,[e] for the Multi-center Robotic Mitral Repair Group[f]

Objective: In a prospective phase II Food and Drug Administration trial, robotic mitral valve repairs were performed in 112 patients at 10 centers by using the da Vinci surgical system. The safety of performing valve repairs with computerized telemanipulation was studied.

Methods: After institutional review board approval, informed consent was obtained. Patients had moderate to severe mitral regurgitation. Operative technique included peripheral cardiopulmonary bypass, a 4- to 5-cm right minithoracotomy, a transthoracic aortic crossclamp, and antegrade cardioplegia. The successful study end point was grade 0 or 1 mitral regurgitation by transthoracic echocardiography at 1 month after surgery.

Results: Valve repairs included quadrangular resections, sliding plasties, edge-to-edge approximations, and both chordal transfers and replacements. The average age was 56.4 ± 0.09 years (mean ± SEM). There were 77 (68.8%) men and 35 (31.2%) women. Valve pathology was myxomatous degeneration in 105 (91.1%), and 103 (92.0%) had type II leaflet prolapse. Leaflet repair times averaged 36.7 ± 0.2 minutes, with annuloplasty times of 39.6 ± 0.1 minutes. Total robot, aortic crossclamp, and cardiopulmonary bypass times were 77.9 ± 0.3 minutes, 2.1 ± 0.1 hours, and 2.8 ± 0.1 hours, respectively. On 1-month transthoracic echocardiography, 9 (8.0%) had grade 2 mitral regurgitation, and 6 (5.4%) of these had reoperations (5 replacements and 1 repair). There were no deaths, strokes, or device-related complications.

Conclusions: Multiple surgical teams performed robotic mitral valve repairs safely early in development of this procedure, with a reoperation rate of 5.4%. Advancements in robotic design and adjunctive technologies may help in the evolution of this minimally invasive technique by decreasing operative times.

From the Brody School of Medicine at East Carolina University, Pitt County Memorial Hospital, Greenville, NC,[a] Advocate Christ Medical Center, Oak Lawn, Ill,[b] Columbia Presbyterian Hospital, New York, NY,[c] University of Southern California, Los Angeles, Calif,[d] and Hoag Heart and Vascular Institute, Hoag Memorial Hospital, Newport Beach, Calif[e] (see Table 1 for a complete listing of participants and institutions[f]).

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Address for reprints: L. Wiley Nifong, MD, Department of Surgery, East Carolina University School of Medicine, 600 Moye Blvd, LSB 248, Greenville, NC 27858 (E-mail: nifongL@mail.ecu.edu).

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Traditionally, cardiac surgery has been performed through a median sternotomy providing surgeons with generous operative exposure. Since 1995, improvements in perfusion technology and instrumentation have stimulated cardiac surgeons to investigate the efficacy of minimally invasive cardiac procedures. In large series of patients, Cohn and colleagues,[1] Cosgrove and colleagues,[2] and Navia and Cosgrove[3] first reported improved outcomes and economic benefits with minimal-access mitral valve (MV) and aortic valve surgery. Subsequently, further developments in intracardiac visualization, instrumentation, and cannulation methods hastened the development and expansion of minimally invasive cardiac surgery.[4,5] Because of these improvements, valve surgery performed through small incisions is now standard practice for many surgeons.

Telemanipulation of tissues has become possible through recent advances in surgical robotic systems, which provide a combination of 3-dimensional vision and microinstrumentation providing a full range of motion in tiny spaces, no tremor, and motion scaling.

TABLE 1. Institutions and investigators

Site	Investigators	No.
East Carolina University Greenville, NC	CS: W. Randolph Chitwood Jr PSS: L. Wiley Nifong	22
Advocate Christ Hospital Oak Lawn, Ill	CS: Pat Pappas PSS: Anthony Tatooles	20
Columbia Presbyterian Hospital New York, NY	CS: Craig Smith PSS: Michael Argenziano	15
University of Southern California Los Angeles, Calif	CS: Vaughn Starnes PSS: Daniel Schwarz	13
St Vincent's Hospital Portland, Ore	CS: Jeffrey Swanson PSS: Michael Savitt	11
Carillon Roanoke Memorial Hospital Roanoke, Va	CS: Joseph Baker PSS: Paul Frantz	9
INNOVA Fairfax Hospital Fairfax, Va	CS: Paul Massimiano PSS: Edward Lefrak	9
Ohio State University Columbus, Ohio	CS: Robert Michler PSS: David Brown	7
Brigham & Women's Hospital Boston, Mass	CS: Lawrence Cohn PSS: Lishan Aklog	4
Baylor Healthcare System Dallas, Tex	CS: Robert Hebeler PSS: Richard Wood	3

CS, Console surgeon; *PSS*, patient side surgeon.

In 1998, Carpentier and Mohr independently performed the first MV repairs by using an early prototype of the da Vinci surgical system (Intuitive Surgical, Inc, Sunnyvale, Calif).[6,7] Mohr and colleagues[8] then reported the first operative series of robotic MV procedures. Mehmnesh and colleagues[9] have performed the only closed-chest endoscopic MV repair to date. Using the Zeus system, Grossi and colleagues[10] performed a posterior leaflet repair in 2000. A month later, with the da Vinci system, Chitwood and colleagues[11] performed a posterior leaflet resection with reconstruction and implanted an annuloplasty band.

TABLE 2. Robotic mitral surgery exclusion criteria

<18 or >80 y of age
Previous right thoracotomy
Renal failure
Liver dysfunction
Bleeding disorders
Pulmonary hypertension (pulmonary artery systolic pressure > 60 mm Hg)
Concomitant MV stenosis
Anterior MV leaflet disease
Significant aortic or tricuspid valve disease
Coronary artery disease requiring surgery
Recent myocardial ischemia (<30 d)
Recent stroke (<30 d)
Severely calcified mitral valve annulus
Body mass index >35 kg/m^2

A phase I clinical trial (G000023) approved by the Food and Drug Administration (FDA) was begun at East Carolina University (ECU) to evaluate safety and efficacy in robot-assisted MV repair surgery. In this initial series, patients were between 18 and 80 years of age and had isolated grade 3/4 mitral regurgitation. All 10 patients had successful MV repairs, with no deaths or complications.[12] The FDA extended this trial to 20 patients to provide training observation at ECU in preparation for the forthcoming phase II trial. In October 2000, an FDA-approved multicenter phase II trial (G000295) was initiated to evaluate the system in a variety of institutional environments. This report describes results from this 10-center multicenter phase II clinical trial evaluating the da Vinci surgical system in 112 MV repair patients.

Patients and Methods

Patients were enrolled by using FDA-approved selection criteria after full institutional review board (IRB) approval at the respective institutions (Table 1). Each patient signed both IRB- and FDA-approved consent forms after informed consent was obtained. Between February 2001 and July 2002, 112 patients were enrolled. Patients between 18 and 80 years of age with echocardiographically confirmed moderate (grade 3) to severe (grade 4) regurgitation requiring a repair were screened for participation. All patients underwent a history and physical examination followed by a chest radiograph and transthoracic echocardiogram (TTE). Quantitation of valve regurgitation was obtained by Doppler color flow imaging, spectral Doppler, and imaging for flow acceleration, as well as measurement of proximal isovelocity surface area. The severity of the regurgitant jet was assessed by parameters includ-

TABLE 3. MV pathology and etiology

Variable	Total (n = 112)	BAY (n = 3)	BWH (n = 4)	CAR (n = 8)	COL (n = 15)	CRH (n = 20)	ECU (n = 22)	FRX (n = 9)	OSU (n = 7)	STV (n = 11)	USC (n = 13)
Etiology											
Myxomatous	105 (91.1)	3 (100)	4 (100)	8 (100)	12 (80.0)	20 (100)	19 (86.4)	9 (100)	6 (85.7)	11 (100)	13 (100)
Other	7 (6.3)	0	0	0	3 (20.0)	0	3 (13.6)	0	1 (14.3)	0	0
Leaflet dysfunction*											
Type I	5 (4.5)	0	0	0	1 (6.6)	0	1 (4.6)	0	2 (28.6)	1 (9.1)	0
Type II	103 (92.0)	3 (100)	4 (100)	8 (100)	14 (93.3)	20 (100)	19 (86.4)	9 (100)	5 (71.4)	10 (90.9)	11 (84.6)
Type III	1 (1.7)	0	0	0	0	0	1 (4.6)	0	0	0	0
Other	3 (2.7)	0	0	0	0	0	1 (4.6)	0	0	0	2 (15.4)
Valve pathology											
Leaflet prolapse	105 (93.8)	3 (100)	4 (100)	8 (100)	14 (93.3)	20 (100)	19 (86.4)	9 (100)	5 (71.4)	10 (90.9)	13 (100)
Chordal rupture	63 (56.3)	1 (33.3)	3 (75.0)	1 (12.5)	6 (40.0)	12 (60.0)	12 (54.6)	7 (77.8)	3 (42.9)	9 (81.8)	9 (69.2)
Isolated annular dilatation	6 (5.4)	0	0	0	1 (6.7)	0	2 (9.1)	0	2 (28.6)	1 (9.1)	0
Leaflet perforation	1 (0.9)	0	0	0	1 (6.7)	0	0	0	0	0	0

BAY, Baylor Healthcare System; *BWH,* Brigham & Women's Hospital; *CAR,* Carillon Roanoke Memorial Hospital; *COL,* Columbia Presbyterian Hospital; *CRH,* Advocate Christ Hospital; *ECU,* East Carolina University; *FRX,* INNOVA Fairfax Hospital; *OSU,* Ohio State University; *STV,* St Vincent's Hospital; *USC,* University of Southern California. Data are n (%). *Leaflet dysfunction as defined by the Carpentier classification.[15]

TABLE 4. Mitral valve repair techniques

Variable	Total (n = 112)	BAY (n = 3)	BWH (n = 4)	CAR (n = 8)	COL (n = 15)	CRH (n = 20)	ECU (n = 22)	FRX (n = 9)	OSU (n = 7)	STV (n = 11)	USC (n = 13)
Isolated annuloplasty ($P = .06$)	11 (9.8)	1 (33.3)	0	0	1 (6.7)	0	3 (13.6)	0	3 (42.9)	2 (18.2)	1 (7.7)
Quadrangular resection ($P < .0001$)	81 (72.3)	2 (66.7)	4 (100)	8 (100)	13 (86.7)	20 (100)	14 (63.6)	9 (100)	4 (57.1)	7 (63.6)	0
Sliding plasty ($P = .0002$)	5 (4.5)	2 (66.7)	0	0	1 (6.7)	0	2 (9.1)	0	0	0	0
Chordal repair, replacement, or shortening ($P < .0001$)	15 (13.4)	0	0	0	0	0	2 (9.1)	1 (9.1)	0	0	12 (92.3)

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ing the superior extent of the jet reaching the left atrial roof, penetration into 1 or both upper pulmonary veins, and penetration into the left atrial appendage. Subject exclusion criteria are outlined in Table 2. Each surgical team was trained at the Surgical Robotic Training Center at ECU by using a curriculum-based program that included case observation, didactic sessions, and both inanimate and cadaver models.[13]

All patients were intubated for single-lung ventilation. Both a pulmonary artery catheter and a 17F venous drainage cannula were placed percutaneously into the right internal jugular vein. A transesophageal echocardiographic (TEE) probe was positioned after intubation. External defibrillator patches were placed to subtend the maximum cardiac mass. Each patient was positioned with the right chest elevated approximately 40° and with the right arm suspended on a padded armrest above the forehead. Femoral arterial and venous cannulation was performed through a 2-cm transverse right groin incision by using the Seldinger guidewire method and TEE guidance. Bicaval venous drainage was instituted through the jugular and femoral/inferior vena cava cannulas. A 5- to 6-cm submammary right minithoracotomy was made, and the fourth intercostal space (ICS) was entered after right lung deflation. The details of intrathoracic preparation have been described in other publications.[14] Cardioplegia administration routes varied depending on institutional choice. Aortic occlusion was performed by using either a transthoracic crossclamp or an endoaortic balloon. Carbon dioxide was insufflated continuously into the operative field for air displacement. An interatrial groove left atriotomy was performed, and each MV was exposed by using a transthoracic intra-atrial retractor (CardioVations, Somerville, NJ).

TABLE 5. Operative characteristics, including times

Variable	Total (n = 112)	BAY (n = 3)	BWH (n = 4)	CAR (n = 8)	COL (n = 15)	CRH (n = 20)	ECU (n = 22)	FRX (n = 9)	OSU (n = 7)	STV (n = 11)	USC (n = 13)
Operation time ($P < .0001$) (min)											
Mean	266.4	309.0	334.3	243.8	386.0	199.7	265.1	295.7	269.6	255.5	203.7
SD	73.0	55.7	43.4	23.6	48.3	35.1	47.7	53.0	62.0	28.5	46.8
Range	150-463	263-371	298-392	218-286	293-463	154-287	198-372	247-414	201-382	196-292	150-306
CPB time ($P < .0001$) (min)											
Mean	168.8	164.3	222.3	193.3	227.3	126.9	162.7	201.7	164.4	164.5	128.9
SD	47.3	8.7	54.0	10.5	52.6	24.3	28.5	42.3	35.7	25.0	27.5
Range	82-316	157-174	175-300	173-205	140-316	95-175	113-216	166-300	117-223	113-188	82-183
Aortic crossclamp time ($P < .0001$) (min)											
Mean	124.1	131.3	173.3	135.6	145.3	89.8	124.6	152.2	134.9	132.5	95.5
SD	34.0	11.0	36.9	14.1	30.9	22.3	20.3	35.8	39.2	26.6	18.9
Range	60-227	124-144	148-227	112-156	96-213	60-143	87-163	117-226	82-196	83-177	67-136
da Vinci time ($P < .0001$) (min)											
Mean	77.9	44.7	114.5	84.1	109.9	65.6	86.8	79.2	66.9	72.6	46.5
SD	30.3	15.0	18.7	13.2	34.1	24.2	16.1	30.0	31.3	27.9	14.1
Range	21-171	28-57	97-141	60-97	61-171	42-128	52-128	60-152	21-115	25-113	29-75
Annuloplasty time ($P < .0001$) (min)											
Mean	39.6	44.0	52.5	38.9	50.5	28.1	42.4	46.9	47.0	37.5	28.2
SD	13.6	6.6	3.5	4.1	13.5	6.7	13.5	11.0	14.7	13.7	9.1
Range	17-79	37-50	49-56	33-45	34-76	19-40	27-79	38-74	25-70	17-56	20-54
Leaflet repair time ($P < .0001$) (min)											
n	101	2	4	8	14	20	19	9	4	9	12
Mean	36.7	36.0	45.8	39.6	48.1	20.7	38.9	48.3	61.3	51.8	13.3
SD	20.4	1.4	10.3	12.2	25.7	11.9	14.7	11.1	17.5	18.5	8.6
Range	5-115	35-37	35-38	22-60	20-115	9-53	19-67	33-70	49-87	29-84	5-36

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da Vinci instrument arms (7 mm) were inserted through two 10-mm trocar incisions. The right instrument arm generally was positioned 4 to 6 cm lateral to the chest incision in either the fourth or fifth ICS. The left instrument arm was positioned medial and cephalad to the right arm in the second or third ICS. Arm trocar sites were maintained 6 cm apart at chest entry. Care was taken to establish optimal arm-vector alignment with the valve plane to ensure full, unrestricted instrument excursion. A specialized 30° stereoscopic endoscope was placed through the medial portion of the minithoracotomy. A patient-side surgeon facilitated instrument changes and needle/suture passing and retrieval. All valve repair and annuloplasty sutures were placed with the da Vinci robot. All left atriotomies were closed either under direct vision or with videoscopic assistance. After crossclamp release, meticulous intracardiac deairing and weaning from cardiopulmonary bypass (CPB) was performed, and pacing wires and chest tubes were inserted. In each patient, a postrepair TEE was performed for analysis by the outside echocardiographic core laboratory.

Clinical information for enrolled patients was collected and verified by trained study monitors. All data were abstracted onto FDA case report forms and entered into a database. Case report forms were completed for the following points: (1) before surgery, (2) during surgery, (3) after surgery (including the intensive care unit), (4) at discharge, and (5) 1 month after surgery. All adverse events were recorded and reported immediately. All echocardiograms were reviewed by an independent core laboratory (Hoag Memorial Hospital, Newport Beach, Calif). These included preoperative TTE, intraoperative TEE before and after each MV repair, and a TTE 1 month after surgery. Intraoperative TEE was performed before institution of CPB and after the valve repair after weaning from bypass. The core laboratory was blinded to echocardiogram findings at each site, and individual sites were blinded to the core laboratory findings. Significant discrepancies were resolved by reanalysis of the echocardiography tapes in question. The core laboratory assessment was used in the final analysis.

All final data analyses were conducted with SAS (SAS Institute, Cary, NC). All continuous variables were analyzed with nonparametric tests, the Wilcoxon ranked sum test for 2-group comparisons, and Kruskal-Wallis analysis of variance for multigroup comparisons. Categorical data were analyzed with χ^2 tests. Data are shown as mean ± SD and range.

Results

Between February 2001 and July 2002, 112 patients with grade 3/4 mitral regurgitation underwent a robotic MV repair with the da Vinci surgical system. Operation at each site was performed by the same console surgeon and up to

TABLE 6. Postoperative characteristics, including times

Variable	Total (n = 112)	BAY (n = 3)	BWH (n = 4)	CAR (n = 9)	COL (n = 4)	CRH (n = 20)	ECU (n = 22)	FRX (n = 9)	OSU (n = 7)	STV (n = 11)	USC (n = 13)
Ventilation time (h)											
Mean	9.1	6.3	15.3	5.5	19.5	0.8	10.6	6.7	12.3	5.5	11.8
SD	12.6	1.2	17.9	3.0	27.1	1.7	5.3	4.4	5.0	5.0	11.2
Range	0-112	5-7	5-42	2-10	2-112	0-5	4-31	3-17	7-19	2-20	3-43
ICU time (h)											
Mean	36.6	31.3	53.0	26.5	48.2	37.2	25.8	30.7	32.3	30.2	55.0
SD	24.7	12.1	45.1	9.6	41.8	20.3	13.0	13.7	13.5	12.2	27.3
Range	6-140	22-45	22-119	21-50	17-140	6-81	8-70	19-56	20-52	19-51	16-98
Length of stay (d)											
Mean	4.7	6.3	7.0	4.4	6.3	2.8	4.3	3.9	4.9	6.1	5.1
SD	3.0	0.6	6.0	1.7	3.5	3.4	1.6	1.0	1.1	4.6	2.0
Range	1-18	6-7	4-16	3-7	3-18	1-16	3-9	2-5	4-7	3-18	3-9

BAY, Baylor Healthcare System; *BWH,* Brigham & Women's Hospital; *CAR,* Carillon Roanoke Memorial Hospital; *COL,* Columbia Presbyterian Hospital; *CRH,* Advocate Christ Hospital; *ECU,* East Carolina University; *FRX,* INNOVA Fairfax Hospital; *OSU,* Ohio State University; *STV,* St Vincent's Hospital; *USC,* University of Southern California; *ICU,* intensive care unit.

TABLE 7. Intraoperative TEE by the core echocardiography laboratory

Variable	Total	BAY	BWH	CAR	COL	CRH	ECU	FRX	OSU	STV	USC
Prerepair regurgitation grade											
Number	107	3	3	8	14	19	21	8	7	11	13
None	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—
2	3 (2.8)	0	0	0	1 (7.1)	0	1 (4.8)	0	1 (14.3)	0	0
3	68 (63.6)	3 (100)	2 (66.7)	6 (75)	6 (42.9)	15 (78.9)	15 (71.4)	2 (25)	4 (57.1)	8 (72.7)	7 (53.8)
4	36 (33.6)	0	1 (33.3)	2 (25)	7 (50)	4 (21.1)	5 (23.8)	6 (75)	2 (28.6)	3 (27.3)	6 (46.1)
Not reported	5										
Postrepair regurgitation grade											
Number	108	3	4	7	14	20	21	8	7	11	13
None	78 (72.2)	3 (100)	1 (25.0)	5 (71.4)	9 (64.3)	12 (60.0)	15 (71.4)	7 (87.5)	6 (85.7)	9 (81.8)	11 (84.6)
1	29 (26.9)	0	3 (75.0)	1 (14.3)	5 (35.7)	8 (40.0)	6 (28.6)	1 (12.5)	1 (14.3)	2 (18.2)	2 (15.4)
2	1 (0.9)	0	0	1 (14.3)	0	0	0	0	0	0	0
3	—	—	—	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—	—	—	—
Not reported	4										

BAY, Baylor Healthcare System; *BWH,* Brigham & Women's Hospital; *CAR,* Carillon Roanoke Memorial Hospital; *COL,* Columbia Presbyterian Hospital; *CRH,* Advocate Christ Hospital; *ECU,* East Carolina University; *FRX,* INNOVA Fairfax Hospital; *OSU,* Ohio State University; *STV,* St Vincent's Hospital; *USC,* University of Southern California. Data are n (%).

2 patient-side surgeons. At study initiation, 324 patients met the initial screening criteria; however, 212 (65.4%) patients were ineligible because of issues related to the inclusion/exclusion criteria (Table 2). Ineligibility was due to concomitant coronary artery disease (n = 61; 30.8%), tricuspid valve disease (n = 49; 24.7%), aortic insufficiency/stenosis (n = 15; 7.5%), and anterior MV leaflet disease requiring repair (n = 15; 7.5%). One hundred twelve patients (34.6%) were enrolled in the study.

The average age of all patients was 56.4 ± 10.2 years, with a range of 37 to 81 years. The average body mass index was 26.6 ± 4.0 kg/m^2 (18.5 to 40.9 kg/m^2). Of the 112 patients, 77 were male (68.8%), and 102 (91.1%) were white. The most prevalent comorbid conditions were a family history of coronary artery disease (n = 59; 52.7%), smoking (n = 39; 34.8%), cardiac arrhythmias (n = 33; 29.5%), hypertension (n = 39; 34.8%), congestive heart failure (n = 22; 19.6%), and cardiomegaly (n = 20; 17.9%). There was a significantly lower prevalence of peripheral vascular disease (n = 5; 4.5%), infectious endocarditis (n = 6; 5.6%), diabetes (n = 3; 2.6%), and rheumatic fever (n = 6; 5.6%). No statistically significant differences in demographic characteristics were found among the patients enrolled.

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Table 3 shows both the pathologies and etiologies of regurgitation in these patients. As expected, most patients had myxomatous MV degeneration (n = 105; 91.1%), resulting primarily in Carpentier classification type II leaflet prolapse (n = 103; 92.0%).[15] Although prolapse was observed most often, approximately half of the patients had other reasons for valvular insufficiency, including chordal rupture (n = 65; 56.3%) and isolated annular dilatation (n = 6; 5.4%). Of the 112 patients, 101 (90.2%) had a valvuloplasty, and all 112 (100%) had a posterior band annuloplasty. As seen in Table 4, the most common valvuloplasty performed was a leaflet resection (n = 81; 72.3%). In addition, 15 (13.4%) patients had a chordal repair, prosthetic replacement, or transfer.

Intraoperative procedural times are shown in Table 5. Of the 101 patients undergoing leaflet repairs, the average time required for excision and reconstruction was 36.7 ± 20.4 minutes (range, 5-115 minutes). The 112 annuloplasty band implantations averaged 39.6 ± 13.6 minutes (range, 17-79 minutes) to complete. Mean aortic crossclamp and CPB times were 124.1 ± 34.0 minutes (range, 60-227 minutes) and 168.8 ± 47.3 minutes (range, 82-316 minutes), respectively. Finally, the average time for da Vinci system use was 77.9 ± 30.3 minutes (range, 21-171 minutes). Of the 112 patients, 25 (22.3%) required intraoperative or postoperative blood replacement products. The 19 patients transfused with packed red blood cells (16.9%) required an average of 2.5 ± 0.9 units (range, 1 to 4 units), and 5 patients (4.5%) received 2.6 ± 1.1 units (range, 1-4 units) of fresh frozen plasma. Six (5.4%) patients were transfused with 4.0 ± 2.6 units (range, 1-8 units) of platelets. Intubation, intensive care, and total hospitalization times are shown in Table 6. The mean ventilation time for the group was 9.1 ± 12.6 hours (range, 0-112 hours), with ICU stays averaging 36.6 ± 24.7 hours (range, 6-140 hours). The length of hospital stay for all patients was 4.7 ± 3.0 days (range, 1-18 days).

All patients had a preoperative TTE within 1 month of trial enrollment. Of the 112 patients, 109 (97.3%) had either grade 3 or 4 regurgitation. The mean preoperative left ventricular ejection fraction was 64.1% ± 6.8% (range, 35%-75%). The Kruskal-Wallis test for analysis of variance showed no significant differences in the severity of either MV regurgitation or left ventricular ejection fraction across institutions (P = .5 and P= .22, respectively). The intraoperative TEE results before and after surgical repairs are shown in Table 7. The prerepair TEE results were similar to the results of the TTE studies. Of the 107 patients with a prerepair intraoperative TEE, 104 (97.2%) had either grade 3 or 4 mitral regurgitation. Of the 107 patients with TEE results, 79 (73.8%) had isolated posterior leaflet disease, whereas 26 (24.3%) had some involvement of both the posterior and anterior leaflets. The postrepair intraoperative TEE showed all but 1 patient to have either grade 1 or no MV regurgitation. Immediate postoperative TEE results confirmed reversion in 99.1% of patients from grade 3/4 regurgitation to either grade 1 or no leak. No significant differences in either preoperative or postoperative regurgitation grades were found across sites (P= .32 and P= .05, respectively).

Of the 112 patients enrolled in the study, 1-month postoperative follow-up TTE showed that 103 (92.0%) had either no or grade 1 regurgitation. Seven (6.3%) had grade 2 regurgitation, and 2 (1.8%) had either grade 3 or 4 leaks. Of these 9 patients, 3 with grade 2 regurgitation are being followed up and have not required reoperation because they have no clinical symptoms. The first of these 3 patients had a type II posterior leaflet prolapse with chordal ruptures and elongations, combined with annular dilatation. A posterior leaflet resection was performed along with a band annuloplasty. The postrepair TEE showed no regurgitation. The second patient had a restricted posterior mitral leaflet with thickened edges. A posterior annuloplasty was performed with no leaflet resection. The immediate postrepair TEE showed grade 1 regurgitation. The third patient had Barlow disease with prolapse of the anterior A_2 and posterior P_2 leaflet segments. An edge-to-edge leaflet repair was performed, followed by a posterior annuloplasty. The postrepair TEE showed grade 1 regurgitation.

Of the 9 patients with more than grade 1 insufficiency at the follow-up TTE, 6 (5.3%) had either grade 2 or 3 regurgitation and required reoperations. Four of the 6 patients had a type II leaflet prolapse repaired with a leaflet resection and annuloplasty band. Three of these 4 had grade 1 regurgitation by TEE after repair, and the fourth had systolic anterior motion. All 4 patients had MV replacements with a mechanical valve. At reoperation, 1 had a dehiscence of the repair, but the other 3 repairs were intact but with new leakage. One of the 6 patients who required reoperation had a type II prolapse with a chordal rupture. The valve was repaired initially with a chordal replacement and annuloplasty band insertion. The postrepair TEE for this patient showed no regurgitation. However, a follow-up TTE showed a grade 2 leak at the posterior annulus. Four months after the first operation, the patient presented with a partial band dehiscence that caused hemolysis necessitating valve replacement. The remaining patient initially had grade 3 mitral regurgitation secondary to type 3 posterior leaflet restriction. The robotic repair consisted of a band annuloplasty, and the initial postrepair TEE showed only trace mitral regurgitation. However, the follow-up TTE showed grade 2 regurgitation with a central jet. Because the patient was symptomatic, the valve was replaced with a bioprosthesis.

There were no operative or midterm deaths; however, there were 11 major adverse events. The 6 that necessitated reoperations were discussed previously. Other complica-

tions included bleeding (re-exploration, n = 3), a pericardial effusion (drainage, n = 1), and a myocardial infarction (n = 1). There were no intraoperative conversions to alternative surgical techniques (eg, sternotomy or thoracotomy enlargement), and there were no da Vinci system–related adverse events. All procedures that were started with the da Vinci system were completed with robotic assistance.

Generalized estimating equations were used to analyze the learning curves associated with da Vinci system MV repairs. This model considers the correlation structure involved with repeated measures for a given surgeon/site participating in the trial. In patients requiring resections, CPB times decreased by 4.3 minutes per progressive case (Figure 1, *A*). In this same group, the mean aortic cross-clamp time decreased by 3.7 minutes per case, and total operative times decreased by 4.4 minutes per case (Figure 1, *B* and *C*).

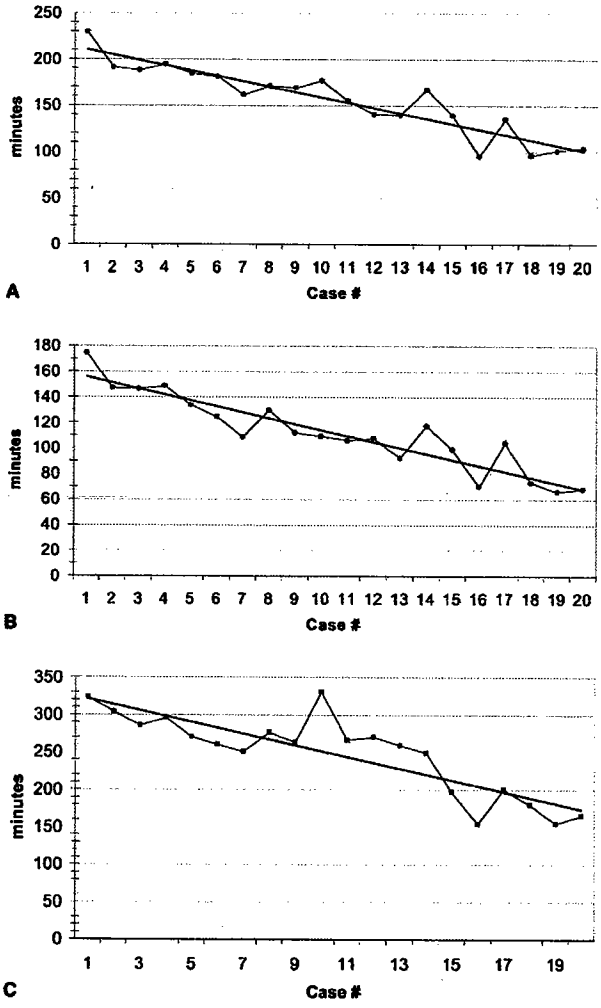

Figure 1. Mean cardiopulmonary bypass *(CPB)* time (A), cross-clamp time (B), and operating time (C) in MV repair cases requiring leaflet resection.

Discussion

Continually improving MV repair methods have rendered outstanding results, but sternotomy still remains the approach of choice for most surgeons. Carpentier and others have shown enviable repair results that have persisted for 15 to 20 years, thus establishing this approach as the "gold standard."[16] Recently, minimally invasive techniques have been developed for valve operations. Partial sternotomies, parasternal incisions, and minithoracotomies were first used to reduce surgical trauma and to minimize hospitalization and transfusions. Beginning in 1995, Cosgrove,[2] Cohn,[1] Grossi,[17] and their associates led this effort, and their results paralleled those of sternotomy-based repairs.[1,2,17] To date, surgeons at the Cleveland Clinic have performed well over 2500 minimally invasive valve operations by combining direct vision with an upper hemisternotomy and modified perfusion techniques. Their minimal-access patients had less than a 1.0% mortality, reduced transfusions (<10%), and earlier hospital discharge compared with those who had sternotomy.[18] Complex operations were performed by these surgeons, as evidenced by their first 607 minimally invasive aortic valve operations, in which 25% were repairs and 26% were homograft replacements. Cohn has performed more than 1000 minimally invasive aortic and MV operations, with similar excellent results.[2] His reoperative rate for MV repair was 3.0%, compared with 6.9% for 893 patients in the 2001 STS database. Similarly, the New York University group reported 375 MV repairs with minithoracotomy, endoaortic balloon occlusion, and direct vision.[17] Again, low operative mortality (1.1%) and good results were shown for complex repairs. Of these patients, 89% had only trace or no residual regurgitation by TEE after the repair.

Despite these and other successful minimally invasive valve operations, most surgeons have not embraced endoscopic methods for MV surgery. Onnasch and associates[19] and Chitwood and Nifong[18] independently showed that endoscopic MV surgery can be performed safely and with "gold standard" results, but in most instances their operations were video assisted rather than totally endoscopic.[5] In contradistinction, Schroeyers and associates[20] have shown that excellent MV repairs can be performed endoscopically by using 2-dimensional visualization and endoaortic occlusion. Few surgeons to date have adopted these methods because of the difficult transition from a wide-access, direct-vision cardiac operation to a completely endoscopic one that requires a combination of new technologies.

By limiting direct access to the valve, visualization becomes impaired, instrument manipulation is encumbered, and surgeon confidence in the safety and quality of the operation may wane. Surgical telemanipulation seems the

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ideal method for operating accurately through the small incisions and in restricted spaces. Robotic technology can provide many potential benefits to cardiac surgeons. Cutaneous incisions can be smaller because of improved optics and instrumentation. Moreover, wristlike articulations transfer the dexterous actions of instrument tips to the plane of the annulus and the papillary muscle level. With the addition of tremor filtration, there is improved precision in tight intracardiac spaces. Moreover, ambidexterity can become a reality for all surgeons. With these devices, leaflet resections, chordal transfers, and sliding plasties can be combined with a band or ring annuloplasty to perform complete repairs.[12]

The results reported herein represent an FDA-approved robotic MV surgery multicenter trial in which experienced MV repair surgeons from 10 centers enlisted patients into a standardized IRB- and FDA-approved protocol. In each patient, the major portion of each operation was performed robotically from a console removed from the operating table. The robotic system performed safely and efficiently, with no operative deaths or conversions due to a system malfunction. Moreover, there were no incision conversions either to a larger thoracotomy or to a median sternotomy.

These patients benefited from minimal musculoskeletal trauma, a low transfusion rate, and early discharge. Although there were no operative mortalities and few complications, 6 patients required reoperations, of which 5 had valve replacements and 1 had a second band annuloplasty. Although these patients had either no or less than grade 1 regurgitation on the postrepair TEE, they presented within 4 months with grade 3/4 regurgitation and symptoms. Repair failures were spread over 4 institutions, all of which had enrolled at least 10 patients in the study. Compared with the STS database, patients in the multicenter robotic trial had significantly lower mortality, fewer neurologic complications, and shorter lengths of hospital stay. Moreover, robotic MV patients tended to have fewer reoperations and overall complications than those in the STS cohort. Transfusion requirements were low (22.3%) and paralleled those of other minimally invasive valve operative series.[21] Despite these benefits, crossclamp and perfusion times were significantly longer in the robot trial patients. The most significant complication, other than recurrent leakage, was a myocardial infarction in a patient secondary to right coronary artery air embolism.

In previous studies, residual regurgitation has been reported as an independent risk factor for reoperation.[15] Lim and colleagues[22] showed that approximately 59% of patients have clinically insignificant regurgitation after a repair. As seen in this series, most repair failures occur, are detected, and are addressed in the early postoperative period. Other authors have shown a mean regurgitant grade of 0.7 after a minimally invasive MV repair.[21,23] In the 112 patients described herein, the mean grade of mitral regurgitation was 3.7 before surgery and 0.5 after surgery on the TTEs analyzed by the core laboratory.

Operative times were longer in this series compared with conventional sternotomy procedures. However, the learning curves demonstrate a progressive decline in crossclamp, CPB, and resection times, as well as overall operative times, in patients having repairs with or without leaflet resections. One can expect that operations performed early in the series would require longer times than those performed after both the surgeon and team have become familiar with the procedure. This same occurrence has been found in video-assisted MV repair series.[24] As surgical teams become even more facile in using these devices, perioperative times can be expected to continue to decrease. Moreover, evolving adjunctive technology, such as annuloplasty band clips, may speed these operations even more.

Study limitations were primarily related to the investigation of an optimal study population with few comorbidities in the patients enrolled. FDA inclusion/exclusion criteria resulted in the exclusion of any patients with conditions such as coronary artery disease, mitral stenosis, bileaflet disease, significant aortic or tricuspid valve pathology, mitral annular calcification, morbid obesity, recent myocardial infarction or stroke, and poor ventricular function.

In summary, this multicenter study has shown that MV repairs can be performed safely in low-risk patients with potential patient benefits by multiple surgeons and teams. Despite the prearranged expertise of these surgeons, this series does suggest a higher early reoperative rate with the robotic methods than with other direct-vision, limited-access MV repairs. However, these data compare favorably to conventional repairs performed by multiple surgeons through a sternotomy. With the evolution of robotic surgical systems, surgeons and their patients can expect to gain the benefits shown in this study.

CSP

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Discussion

Dr Friedrich W. Mohr *(Leipzig, Germany).* I would like to congratulate the authors on a very successful prospective multicenter phase II FDA trial performing total endoscopic MV repair in 112 patients by using the Intuitive telemanipulation system. In 1998, Professor Carpentier and I independently performed the first MV repairs by using this system. Optimal visualization, precise cutting, and suturing seemed to be very advantageous as compared with normal endoscopic instruments.

In our own series, we have completed 26 of 28 successful MV repairs, including very complex repairs. We had to learn that the current technology still is suboptimal, and it was very hard to manage simple techniques such as the implantation of a complete remodeling ring and time-consuming knot tying.

During the past 3 years, we favored video-assisted surgery for routine use. However, we are working together with Intuitive on a concept for better teaching and training in endoscopic MV repair by using 2 consoles to apply computer simulation.

This article demonstrates very nicely that this type of MV surgery has been successfully introduced in the United States and has been further developed, especially by Dr Chitwood's group. I want to congratulate all the centers and authors for this tremendous work.

One has to understand that the results being presented reflect the situation of a completely new operation, and one has to accept that every surgeon has had to learn how to do it. There was no mortality, and there were no major intraoperative complications or neurologic deficits. The initial success rate of MV repair was very high: 99.1%.

I would like to ask 3 questions. You were mentioning that every team went through a special training for robotic MV surgery before clinical application. Can you elaborate on this and describe what was deemed to be necessary? Did all the centers have experience in minimally invasive video-assisted MV surgery?

Ten centers contributed to the study. Patient enrollment varied between 3 and 22 patients depicting different stages in the learning curves. Furthermore, you could demonstrate a clear improvement per given case concerning mean times of surgery, mean cross-clamp times, and so on. How many patients should one operate on to feel comfortable?

The failure rate of successful MV repair was 9 (8%) of 112 within 1 month; 6 patients needed reoperation. Even if this reoperation rate compares favorably to the STS database rates, it seems high to me, because you were dealing with highly selected patients with uncomplicated MV disease. Do you think this may be due to the compromise of using a posterior band instead of a remodeling ring in such patients or inadequate compression by the suture technique?

Dr Nifong. Professor Mohr, thank you very much for your kind words and also legitimate criticisms. It is an honor to have our article reviewed by a pioneer in the field of robotic and minimally invasive cardiac surgery. Your team in Leipzig has contributed a great deal to this field.

To answer your first question regarding training for robotic mitral valve surgery, we have an intense 2-day program for training surgical teams. This occurs after teams have completed the "system" training, which is when they learn how to use the system and perform troubleshooting for potential problems. Valve training includes live case observation in the operating room followed by didactic discussion and review of the case. Issues related to peripheral cardiopulmonary bypass, aortic occlusion, cardioplegia administration, and deairing are reviewed and discussed.

We then spend a day and a half in the robotic laboratory using inanimate models, porcine hearts, and cadavers. We review each step of the procedure, including patient positioning, incisions, exposure, cannulation, retraction, and positioning of both the robotic surgical cart and instruments. All centers involved in the multicenter trial had experience in minimally invasive mitral valve surgery. However, at this time we are training teams with less minimally invasive or videoscopic experience, and they perform very well.

To answer your second question, we have performed 81 robotic mitral valve procedures and recently reviewed all the

data with learning curves. In our experience, one should expect to complete approximately 15 cases before times begin to decrease.

To answer your third question, we are very sensitive to the issue regarding the 6 patients who required reoperation. One concerning issue is that none of those patients had more than grade 1 mitral regurgitation by postrepair transesophageal echocardiography, and these readings were by an off-site cardiologist blinded to the institution and procedure performed. At follow-up, these patients had advanced to grade 2 or worse mitral regurgitation.

As you are aware, it is quite difficult to manage a more rigid ring in the small space of the left atrium by using the robotic system; however, it can be done, and we have recently performed 2 valve replacements. We are currently working on ideas related to a new type of annuloplasty ring that may answer this problem and allow one to perform a full remodeling annuloplasty, if needed.

We do not believe that the suturing technique is a problem. The high magnification of vision systems allows the surgeon to see the compression and tightness of the knots. Air knots are easily seen and avoided.

Thank you again for reviewing our article.

Preliminary Experience with Robot-Assisted Laparoscopic Myomectomy

Arnold P. Advincula, M.D., Arleen Song, M.D., M.P.H., William Burke, M.D., and R. Kevin Reynolds, M.D.

Abstract ***(J Am Assoc Gynecol Laparosc 2004, 11(4):511–518)***

The following retrospective case series evaluated the technique and feasibility of integrating robot-assisted technology in the performance of a laparoscopic myomectomy in order to overcome the limitations of conventional laparoscopy. We attempted 35 robot-assisted laparoscopic myomectomies in a university hospital setting with a conversion rate of 8.6%. There were a total of 48 myomas removed in 31 patients with completed robot-assisted laparoscopy. The mean number of myomas removed/patient was 1.6 (range 1–5). The mean diameter of myomas removed was 7.9 ± 3.5 cm (95% CI 6.63–9.13), with the majority greater than 5 cm. The mean myoma weight was 223.2 ± 244.1 g (95% CI 135.8–310.6). Mean operating time was 230.8 ± 83 minutes (95% CI 201.6–260). The average estimated blood loss was 169 ± 198.7 mL (95% CI 99.1–238.4). One patient experienced cardiogenic shock from vasopressin, two developed postoperative infections, and one was found to have adenomatous adenomyosis instead of a leiomyoma. The median length of hospital stay was 1 day. Overall, robot-assisted laparoscopic myomectomy is a promising new technique that may overcome many of the surgical limitations of conventional laparoscopy.

The primary surgical management of symptomatic leiomyomata for women desiring future fertility or uterine conservation is myomectomy. The overwhelming majority of cases are performed with laparotomy. Today, many cases of intramural and subserous leiomyomata are managed with laparoscopic myomectomy as a result of the advent of modern-day minimally invasive surgery techniques.[1] The management of leiomyomata endoscopically is one of the more challenging procedures in minimally invasive surgery and requires a skilled surgeon. The ability to enucleate leiomyomata and repair the uterus with multilayer-sutured closure is crucial but technically challenging. For many surgeons, this is thought to affect conversion rates to laparotomy and may play a role in cases of uterine rupture. Despite laparoscopic benefits such as faster postoperative recovery and potentially fewer postoperative adhesions as compared with laparotomy, many technical concerns still exist.

The telerobotic da Vinci Surgical System (Intuitive Surgical, Sunnyvale, CA) is a laparoscopic device designed to overcome the surgical limitations of conventional laparoscopy by providing surgeons with improved dexterity and precision coupled with three-dimensional imaging that allows for the completion of complex minimally invasive procedures. The da Vinci system consists of three components (Figure 1). The first component is the surgeon console where the surgeon controls the robotic system remotely. A stereoscopic viewer as well as hand and foot controls are housed in this unit. The second component of the da Vinci system is the InSite Vision System (Intuitive Surgical, Sunnyvale, CA), which provides 3-D imaging through a 12-mm endoscope containing stereoscopic cameras and dual optical lenses. The third component is the patient-side cart with telerobotic arms and EndoWrist instruments (Intuitive Surgical, Sunnyvale, CA). Currently, this system is available with either three or four robotic arms. One of the arms holds the laparoscope while the other two to three arms hold the various laparoscopic surgical instruments such as DeBakey forceps and needle driver. These EndoWrist instruments are unique in that they possess 7 degrees of movement that replicates the full range of motion of the surgeon's hand as controlled from the surgeon console. Movement is intuitive, and as a result, the fulcrum effect seen with conventional laparoscopy is eliminated.

We sought to evaluate the feasibility of integrating robot-assisted technology in the performance of laparoscopic myomectomy in order to overcome the technical limitations of conventional laparoscopy seen with this particular procedure. To date, there have been no published reports using a robot-assist device to complete a laparoscopic myomectomy. Our preliminary experience is the first such report as well as the largest robot-assisted laparoscopy series in the gynecologic literature.

Materials and Methods

A retrospective chart review for data abstraction was performed after obtaining approval from our institutional

From the Department of Obstetrics and Gynecology, University of Michigan Medical Center, Ann Arbor, Michigan (all authors).

Corresponding author Arnold P. Advincula, M.D., Department of Obstetrics and Gynecology, University of Michigan Medical Center, L 4000 Women's Hospital, 1500 East Medical Center Drive, Ann Arbor, MI 48109.

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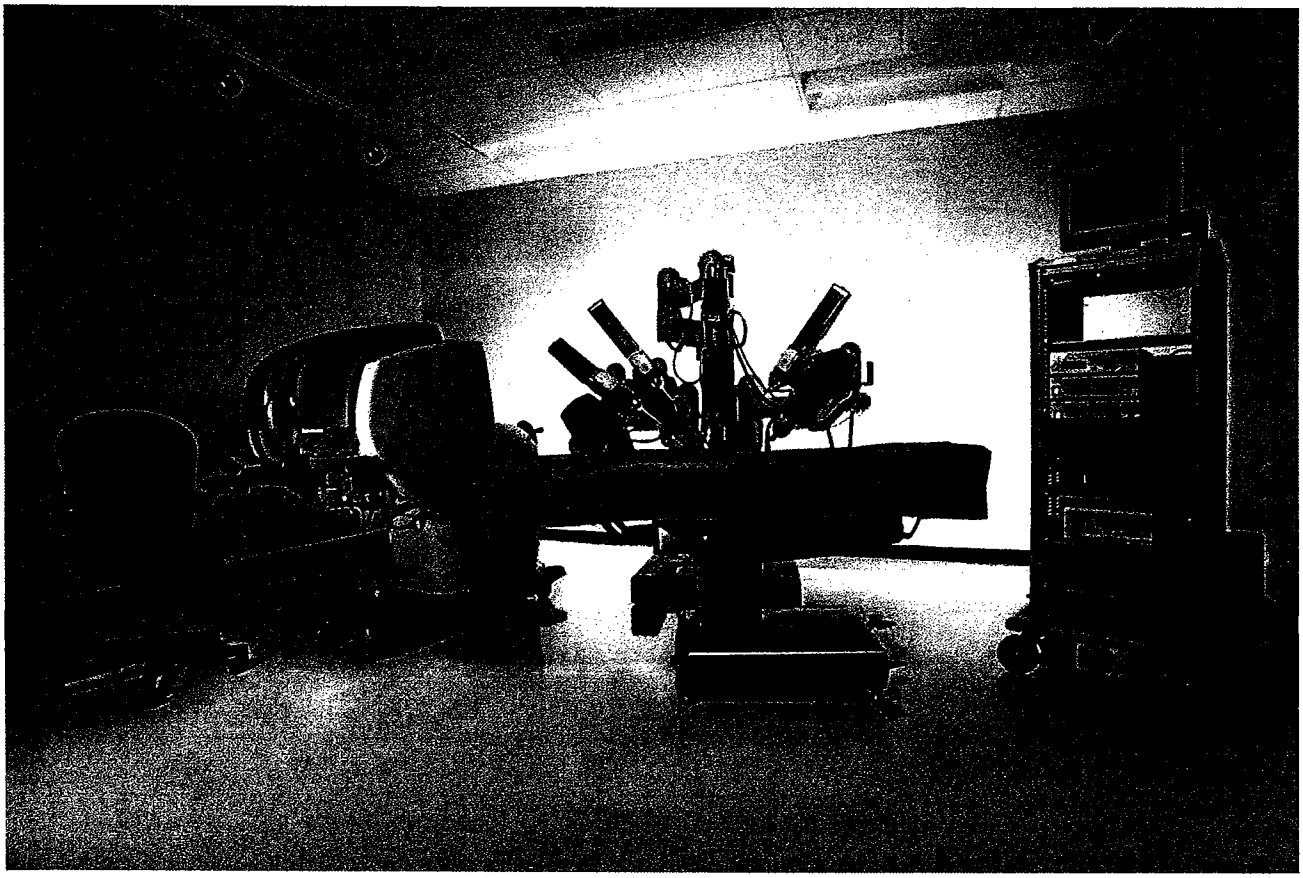

FIGURE 1. Photograph of the da Vinci Surgical System. From left to right: surgeon's console, patient-side surgical cart, and InSite vision tower. Photo courtesy of Intuitive Surgical, Inc.

review board. All robot-assisted laparoscopic myomectomies attempted at the University of Michigan Medical Center from December 2001 through April 2004 were analyzed based on the intent to treat. Patients with symptomatic leiomyomata thought to be approachable with conventional laparoscopic myomectomy due to size, number, and/or location were offered a robot-assisted approach. The purpose of this study was to determine feasibility of this new technique. Based on the authors' experience, relative contraindications to this approach were leiomyomata thought to be too large for safe laparoscopic entry. All procedures were performed by at least two of the four authors. Preoperative radiologic imaging with ultrasound was obtained in all patients. Magnetic resonance imaging (MRI) was used in 19 of the 35 patients in order to quantify more adequately and locate uterine leiomyomata in cases where ultrasound was not diagnostic. Statistical analysis was performed with Excel software (Microsoft Corp., Redmond, WA).

Operative Technique

All patients were placed in low dorsal lithotomy position with arms padded and tucked at their sides after general endotracheal anesthesia was administered. The bladder was drained with a Foley catheter, and either a ZUMI or RUMI uterine manipulator (Cooper Surgical, Trumbull, CT) was placed. Four trocars typically were used after pneumoperitoneum was obtained. A 12-mm trocar was placed either at or above the umbilicus depending on the size of the uterus (Figure 2). This trocar accommodated the endoscope. Occasionally, a left upper quadrant entry with a 3-mm microlaparoscope was performed in order to help guide operative trocar placement in patients with a markedly enlarged uterus or who were at risk for pelvic adhesions such as prior abdominal surgery. Two 8-mm trocars, which mount directly to the surgical cart's two operating arms, were placed in the left and right lower quadrants, respectively. This location was typically medial to the anterior superior iliac spine 3 cm on a diagonal line to the umbilicus. In cases where leiomyomata were above the pelvic brim, lateral trocar placement was moved cephalad in order to allow adequate working distance between the superior-most border of the enlarged uterus and the port site. A fourth trocar, which served as an accessory port, was placed between the camera port and the right lower quadrant port. This was typically 12 mm in order to facilitate introduction of suture, a tissue morcellator, and suction/irrigation instruments.

When all four trocars were in place, the patient was placed in steep Trendelenburg position, and the surgical cart with three robotic arms was brought between the patients

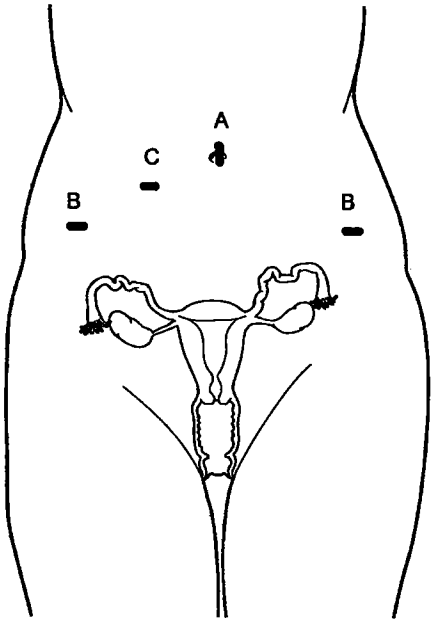

FIGURE 2. Port placement. The camera port (A) was 12 mm, either at or above the umbilicus depending on size of the uterus. The lateral ports (B) were 8-mm da Vinci ports in the lower quadrants of the abdomen. The assist port (C) was 12 mm placed between the camera port and the right lower quadrant port.

legs and docked, meaning that each trocar was attached to the assigned robotic arm with the exception of the accessory port. The camera arm was attached to the umbilical or supraumbilical trocar. The right and left operating arms were attached directly to the right and left lower quadrant trocars, respectively.

A survey of the operative field was performed, after which a dilution of vasopressin (20 U in 40 mL of saline) was infiltrated via a 7-inch, 22-gauge spinal needle transabdominally into the myometrium as an adjunct for hemostasis. ProGrasp (Intuitive Surgical, Sunnyvale, CA) fenestrated forceps and monopolar cautery hook, both EndoWrist instruments, were attached to the right and left operating arms and used to incise the serosa and perform the myomectomy. Counter-traction was provided by the bedside surgeon assistant through the accessory port with a myoma grasper or corkscrew. Adequate hemostasis was obtained with the combination of vasopressin, monopolar electrocautery, and bipolar coagulation. Once the myoma(s) were enucleated, attention was directed toward closure of the myomectomy resection bed(s). EndoWrist instruments were changed to DeBakey forceps and needle driver. A three-layer closure modeled after traditional open surgical technique was used. Interrupted sutures of 0-polyglactin on CT-2 needles were used to close the first two layers with interrupted figure-of-eight stitches followed by a running baseball stitch of 3-0-polyglactin on a SH needle for the serosa. All knots were tied intracorporeally. Once the uterine defect(s) were repaired, a serrated-edge macromorcellator (WISAP, Munich, Germany) was introduced through the accessory port, and the specimen(s) were extracted. A low pressure check was performed to ensure hemostasis, and the robot-assist device was undocked. A slurry of Seprafilm (Genzyme, Cambridge, MA) was left in the pelvis as an adhesion prophylaxis measure before undocking of the surgical cart and closure of the trocar sites.

Results

There were 35 attempted procedures with three conversions to laparotomy (8.6%). Two conversions were secondary to absence of haptic or tactile feedback that made enucleation of the leiomyomas difficult. The third conversion was a result of cardiogenic shock from the vasopressin used as an adjunct for hemostasis. One patient was found to have uterine enlargement secondary to adenomatous adenomyosis, and therefore a myomectomy was not performed. All patients had one or more symptoms outlined in Figure 3.

Among the thirty-one completed procedures where robot-assisted laparoscopic myomectomy was performed, the mean age was 33.4 years (range 24–45 years). The mean body mass index was 25.3 ± 3.78 kg/m^2 (95% CI 23.9–26.6). Data on the weight of the leiomyomata were available in 30 of the 31 completed procedures. The median weight was 164.5 g. The mean myoma weight was 223.2 ± 244.1 g (95% CI 135.8–310.6) with the majority in the range of zero to 250 g (Figure 4). Forty-eight myomas were removed in the 31 patients who successfully underwent robot-assisted laparoscopic myomectomy. The mean number of myomas removed was 1.6 (range 1–5). The mean diameter was 7.9 ± 3.5 cm (95% CI 6.63–9.13). The majority of myomas fell into the greater than 5 cm range (Figure 5). The locations of the leiomyomata were distributed in all areas of the uterus as seen in Figure 6.

Estimated blood loss (EBL) was calculated by noting the difference between the volumes of aspirated and irrigated fluids. In the 31 completed procedures, the mean EBL was 169 ± 198.7 mL (95% CI 99.1–238.4). There were no blood transfusions performed in our series. The mean operating time was 230.8 ± 83 minutes (95% CI 201.6–260.0).

Complications in this series included three conversions to laparotomy, one aspiration pneumonia, one port-site infection, and one case where no myoma was present. This patient had adenomatous adenomyosis (Table 1). One patient in the conversion to laparotomy group developed cardiogenic shock from intravasation of vasopressin. Raynaud's disease in this individual was found to be a compounding factor. Fortunately, postoperative recovery was uneventful with no residual sequelae. Patients with the described complications had an extended length of hospital stay. The overall median length of stay for all patients in our series of completed cases was 1 day (range 0–5 days).

Discussion

Laparoscopic myomectomy has provided a minimally invasive alternative to laparotomy for treatment of intramural and subserous leiomyomata. This approach is technically

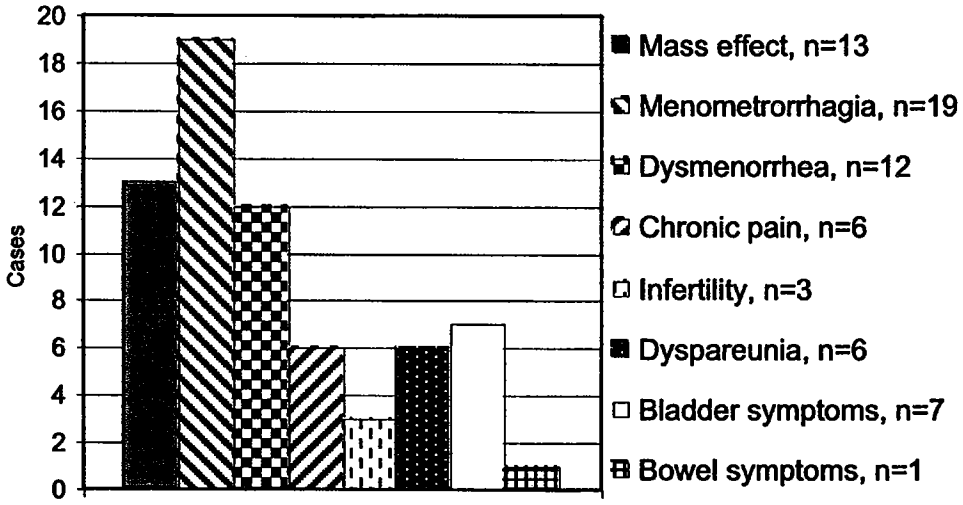

FIGURE 3. Patient symptoms.

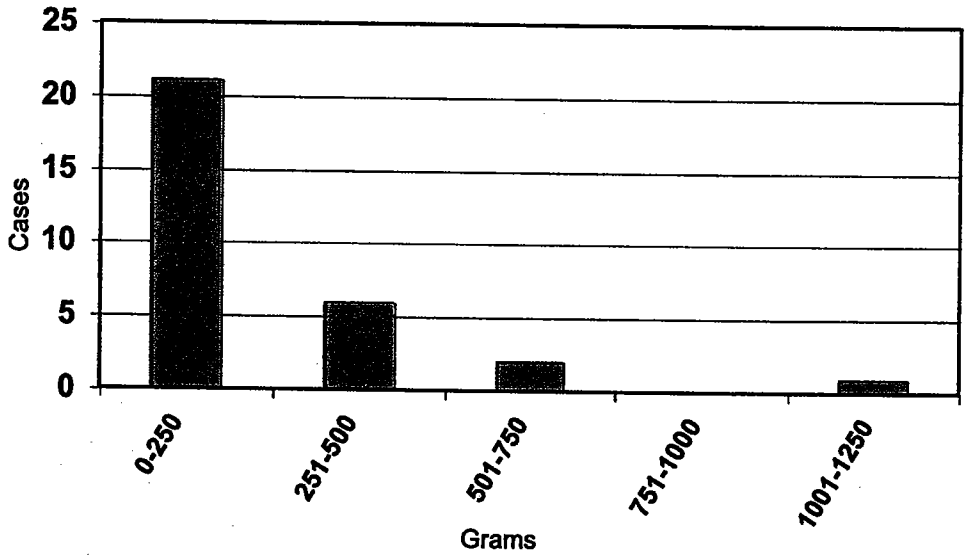

FIGURE 4. Weight of leiomyomata removed.

demanding and generates debate, particularly with regard to selection of surgical candidates, conversion rates, and risk of uterine rupture. Several comparative trials showed postoperative morbidity was less and recovery was faster in laparoscopic procedures compared with laparotomy procedures.[2,3] On the other hand, operative time is usually significantly longer with the laparoscopic approach, especially in cases where there are more than four myomas removed or when the largest myoma has a mean diameter of greater than 6 cm.[2] In the past, surgeons have suggested the need to limit laparoscopic myomectomy based on size, number, and/or location of leiomyomas, particularly as a result of inherent technical problems such as hemostasis, uterine closure, and tissue extraction. Surgeon skill level also plays a significant role in the ability to complete a laparoscopic myomectomy successfully.

The use of robotic technology to facilitate laparoscopic procedures has increased over the past decade. In numerous studies, it has been shown to be a safe and effective alternative to conventional laparoscopic surgery. In gynecologic literature, there are reports of robot-assisted laparoscopy for tubal reanastomosis, hysterectomy, and repair of vaginal vault prolapse.[4–7] We sought to determine the feasibility of incorporating robot-assisted technology as a means not only to complete a laparoscopic myomectomy but also to overcome surgical limitations encountered with conventional laparoscopy.

Our conversion rate of 8.6% was comparable to those in other published studies of conventional laparoscopic myomectomy, which range from zero to 28.7%.[8–11] In one study, with an 11.3% conversion rate, four preoperative factors were found to be independently related to the risk

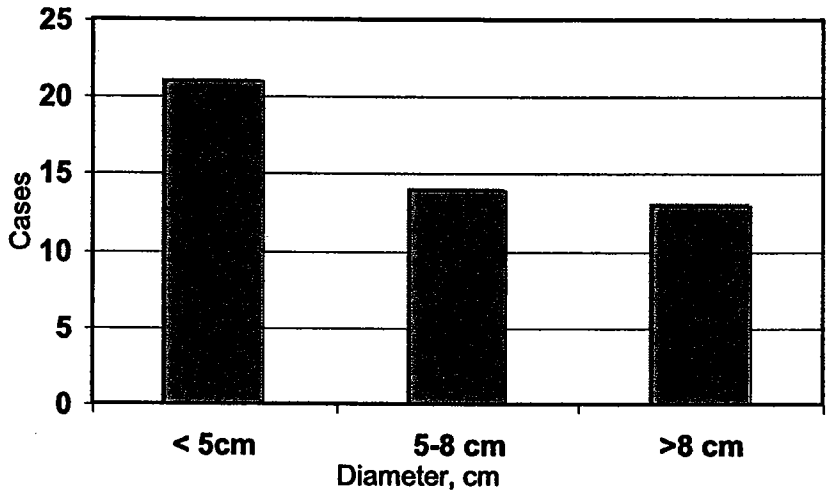

FIGURE 5. Preoperative size assessment of leiomyomata diameter.

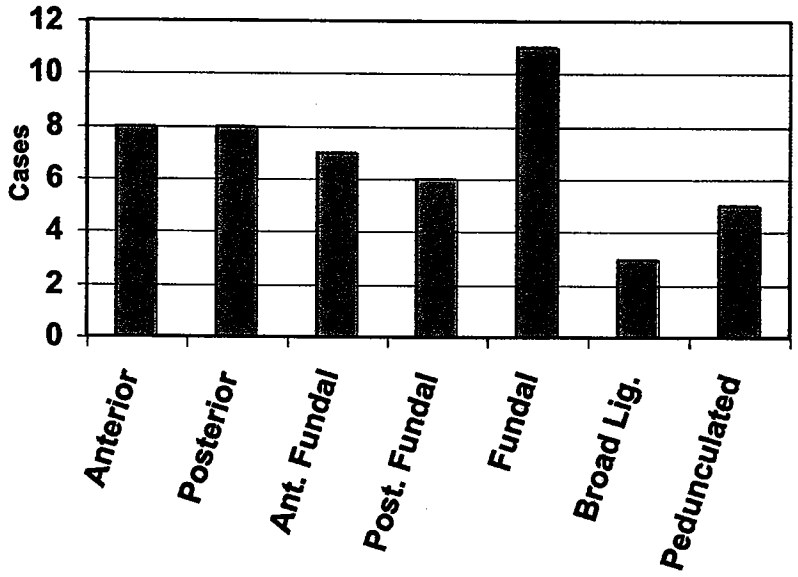

FIGURE 6. Location of leiomyomata.

TABLE 1. Complications

Complication	Number	LOS (days)
Adenomatous adenomyosis, no leiomyoma; procedure discontinued	1	0
Aspiration pneumonia, postoperative	1	5
Cardiovascular collapse after infiltration of vasopressin into uterus, converted to laparotomy	1	3
Difficult enucleation secondary to absent tactile feedback, converted to laparotomy	1	3
Superficial infection of port site, not re-admitted	1	1
Difficult enucleation secondary to absent tactile feedback, converted to laparotomy	1	2

LOS = length of stay.

of conversion to laparotomy.[12] These factors were myoma size greater than or equal to 5 cm, intramural myoma, anterior location, and the preoperative use of gonadotrophin-releasing hormone agonists. Gonadotrophin-releasing hormone agonists were used in only one of the patients in our series to control preoperative anemia. It has been our preference to avoid their use preoperatively due to the softening of the leiomyoma, which in turn makes cleavage planes and enucleation difficult.[13,14] In comparison to the previously cited study, our conversion rate remained low despite the fact that the majority of leiomyomas were greater than 5 cm and intramural.

The ability to suture adequately a uterine defect laparoscopically has always been a concern. In fact, laparoscopic-assisted myomectomy has been suggested in the past with enucleation of myomas performed laparoscopically and uterine closure done through a minilaparotomy incision.[15] In our series, there were no conversions to laparotomy as a result of suturing difficulty or inability to enucleate myomas due to size or location. We attributed this primarily to the EndoWrist instruments that replicate the complex motions of the surgeon's hands. The majority of myomas removed were assessed preoperatively to have diameters greater than 5 cm and were from a variety of locations. Sixteen of the 48 myomas removed were 8 cm or larger. Regardless of the location of the myoma in the uterus, all defects were able to be closed with a multilayered technique. We believe that with robot-assisted laparoscopy, location and size of myomas as well as closure of the uterine defect need not be limiting factors for successful completion of a totally laparoscopic myomectomy.

Our low conversion rate is also significant given the fact that the da Vinci Surgical System provides no tactile or haptic feedback. One limitation of the current state of the art in robot-assisted laparoscopy is absence of tactile feedback to the surgeon operating the EndoWrist instruments remotely at the surgeon's console. Haptics, the technology allowing tactile feedback to be relayed to the surgeon, is used in robotic applications such as the space shuttle arm. Incorporation of haptics into robot-assisted laparoscopy has not yet occurred due to the expense of the technology. This limitation was found to play a significant role in two of the three conversions to laparotomy in our series despite adequate visualization and access with the EndoWrist instruments. Successful enucleation of the leiomyomas was hampered as a result of the lack of tactile sensation. Patient size did not factor into these conversions to laparotomy since patient body mass index was comparable in the conversion group to that of the completion group. The average body mass index in these three patients was 25.6 kg/m^2 (range 18.4–35.6 kg/m^2).

Although operative times were much longer than in most published studies of laparoscopic myomectomy, a definite trend of decreasing times was seen as experience with the robot-assisted approach grew[8–11] (Figure 7). This trend existed despite the fact that there were several very large leiomyomata later in this series. As expected, the removal of larger leiomyomata resulted in longer operative times (Figure 8). On the other hand, longer operative times with the robot-assisted approach did not affect the length of hospital stay, which was comparable to other studies.

Hemostasis during the robot-assisted laparoscopic myomectomies was achieved with a combination of vasopressin, monopolar electrocautery, bipolar coagulation, and suturing. We believe hemostasis was further enhanced by the da Vinci system's 3-D imaging and precise instrument movement, which made dissection and enucleation of the myoma along its tissue planes easy and relatively bloodless. In our series, EBL was comparable to or better than that of published studies. One recent series reported a postoperative blood transfusion rate of 39.2% with conventional laparoscopic myomectomy.[8] There were no blood transfusions in our series. Figure 9 shows a correlation of blood loss with increasing myoma weights in our series.

One patient early on in our series was able to successfully undergo a robot-assisted laparoscopy but a myomectomy was not preformed. The uterine mass upon serosal incision was consistent with adenomatous adenomyosis and was not resectable. This patient strongly desired uterine conservation. No protocol was in place for obtaining preoperative MRI versus pelvic ultrasound at the beginning of this series. As the series progressed, the trend was to obtain MRIs. This imaging modality provided a two-fold benefit. The first was to rule out adenomyosis and confirm leiomyomata. Secondly, a more detailed description of the number and location of myomas was obtained with MRI. Nineteen of the 35 patients in our series underwent preoperative imaging with MRI.

The cost of the da Vinci Surgical System is approximately $1,000,000. The EndoWrist instruments are rated for 10 surgical procedures each, which imparts an additional cost for disposables per procedure. Although current cost is high, as with any new technology, cost is likely to decrease over time.

Conclusion

The key to successful treatment of symptomatic leiomyomata in a minimally invasive fashion lies in appropriate selection of patients. Many attempts have been made to establish criteria for candidates for laparoscopic myomectomy given the limitations of conventional laparoscopy. Of particular concern is the ability to enucleate leiomyomata greater than 5 cm, suture endoscopically, and maintain hemostasis.[12] Surgeon skill level has been found to affect success rates. We believe that based on our experience, the use of robot-assisted technology such as the da Vinci Surgical System is feasible for the removal of leiomyomata in an endoscopic fashion. Although the da Vinci system provides improved instrument precision and dexterity as well as 3-D imaging, the absence of tactile feedback and longer operative times remain limitations. Currently, the robot-assisted approach may not offer a distinct advantage when it comes to operative time. However, this feasibility study indicates that with increasing experience, operative time is becoming progressively shorter. Evolving robotic technology may further improve patient outcomes while presenting new options for the management of leiomyomata in the

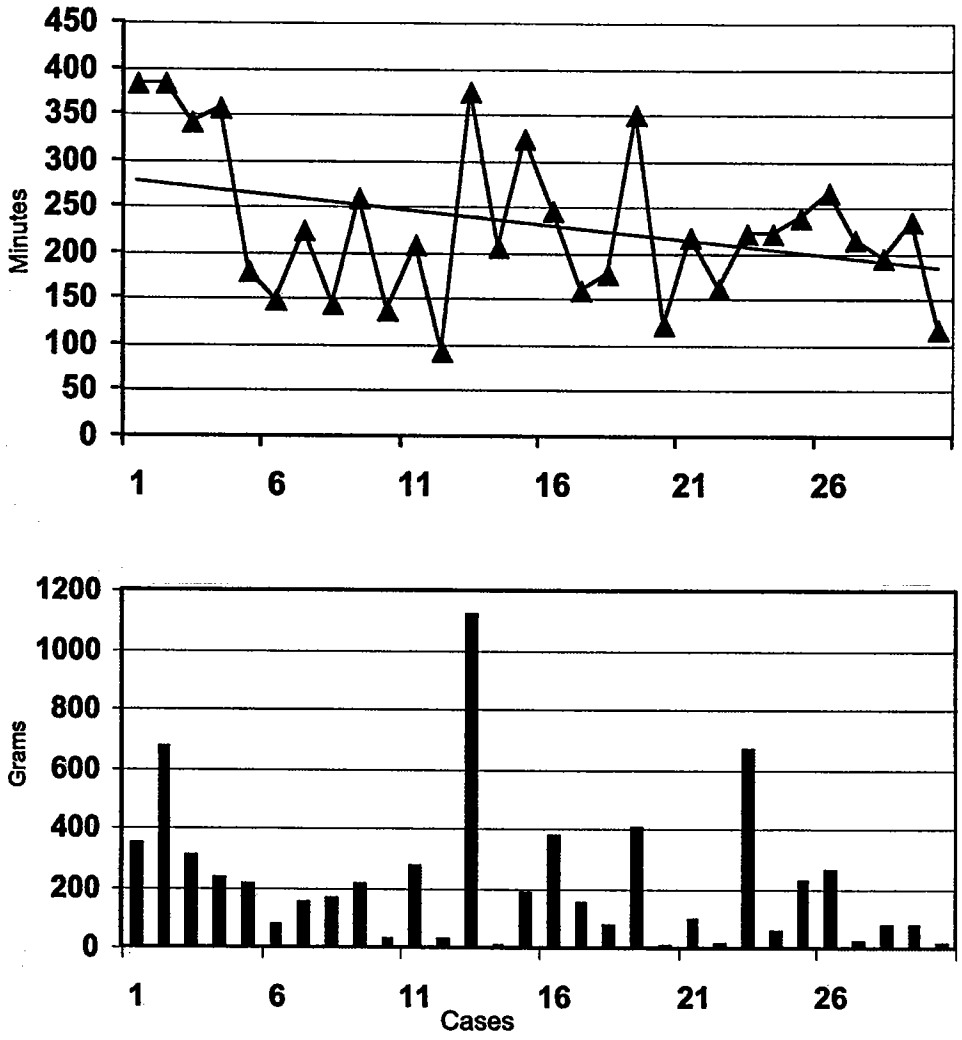

FIGURE 7. Operating time with evolving experience (A) and associated weight of leiomyomata (B).

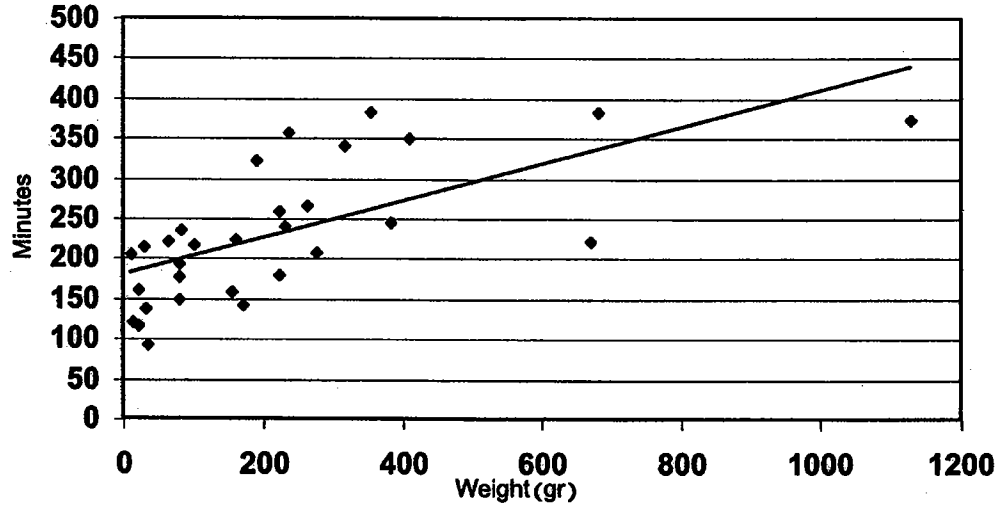

FIGURE 8. Operating time as a function of weight of leiomyomata.

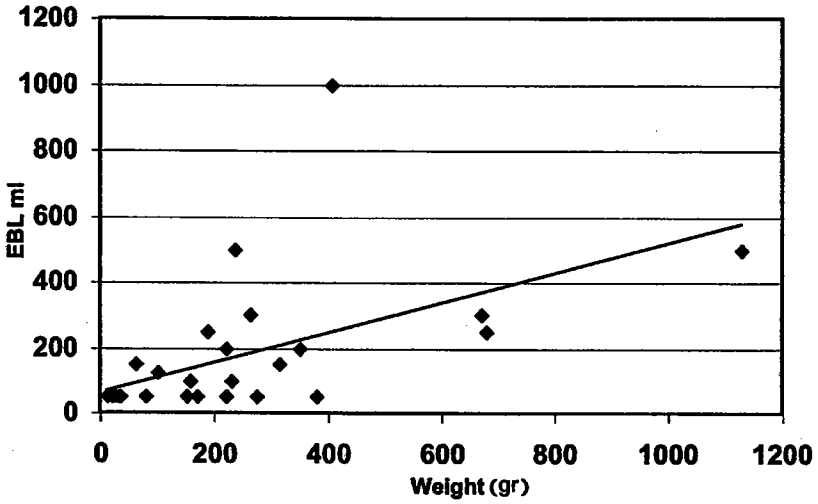

FIGURE 9. Blood loss as a function of weight of leiomyomata. EBL = estimated blood loss.

future. To date, there are no reported pregnancies in our series. Long-term analysis of outcomes is ongoing.

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SCIENTIFIC PAPER

JSLS

The Use of Robot-Assisted Laparoscopic Hysterectomy in the Patient With a Scarred or Obliterated Anterior Cul-de-sac

Arnold P. Advincula, MD, R. Kevin Reynolds, MD

ABSTRACT

Objective: The scarred or obliterated anterior cul-de-sac may pose a challenge to hysterectomy by any route. Conventional laparoscopic hysterectomy is fraught with technical limitations that limit the ability to compensate for the altered anatomy. This study will evaluate the feasibility of applying robot-assisted laparoscopy to managing these patients.

Methods: Six patients with suspected pelvic adhesive disease involving the anterior cul-de-sac underwent robot-assisted laparoscopic hysterectomy for benign indications. Data were collected and analyzed as a retrospective case series analysis.

Results: We attempted 6 robot-assisted laparoscopic hysterectomies with no conversions to laparotomy. The mean uterine weight was 121.7g (range, 70 to 166.3). Mean operating time was 254 minutes (range, 170 to 368). The average estimated blood loss was 87.5 mL. One patient developed a delayed vaginal cuff hematoma. The average length of hospital stay was 1.3 days.

Conclusion: Robot-assisted laparoscopic hysterectomy is a feasible technique in patients with a scarred or obliterated anterior cul-de-sac and may provide a tool to overcome the surgical limitations seen with conventional laparoscopy.

Key Words: Robot-assisted laparoscopy, Laparoscopic hysterectomy, Pelvic adhesions, Surgical technique.

INTRODUCTION

Approximately 600 000 hysterectomies are performed annually in the United States with the majority due to benign conditions.[1–3] Before the introduction of laparoscopic-assisted vaginal hysterectomy in the late 1980s, hysterectomies were approached by either a vaginal or abdominal route.[4] Since the 1990s, a definite trend toward laparoscopic hysterectomy has been seen. Despite the increasing acceptance of laparoscopy, hysterectomy via laparotomy remains the most common route. This is particularly true in cases of advanced pathology, such as pelvic adhesions of which the scarred or obliterated anterior cul-de-sac is one example **(Figure 1)**. This finding is known to pose a challenge by any route. The ability to complete a hysterectomy in a minimally invasive fashion is affected not only by the surgical anatomy field but also by the surgeon's skill level and the technical limitations of conventional laparoscopic instruments.[5] We view the use of robot-assisted technology as a means to overcome these surgical limitations by providing surgeons with improved dexterity and precision coupled with advanced imaging that allows for the completion of complex minimally invasive procedures.

F1

The da Vinci Robotic Surgical System (Intuitive Surgical) is a laparoscopic-assist device that is designed to address many of the current limitations of conventional laparoscopy. It is comprised of 3 components. The first component is the surgeon console that is located remotely from the patient bedside. The surgeon seated at this console is able to control robot-assisted instruments within the patient with the aide of a stereoscopic viewer, hand manipulators and foot pedals. The second component of the da Vinci system is the InSite vision system that provides 3-dimensional imaging through a 12-mm, dual optical endoscope. The third component of the da Vinci system is the patient-side cart with robotic arms and Endowrist instruments. Currently, this system is available with either 3 or 4 robotic arms. One of the arms holds the endoscope while the other 2 to 3 arms hold the various 8-mm Endowrist instruments. These Endowrist instruments are unique in that they possess a wrist-like mechanism that allows 7 degrees of movement, thereby replicating the full range of motion of the surgeon's hand and in turn elimi-

Department of Obstetrics and Gynecology, University of Michigan Medical Center, Ann Arbor, Michigan, USA (all authors).

Address reprint requests to: Arnold P. Advincula, MD, Department of Obstetrics and Gynecology, University of Michigan Medical Center, L 4000 Women's Hospital, 1500 East Medical Center Dr, Ann Arbor, MI 48109, USA. Telephone: 734 764 8429, Fax: 734 647 9727, E-mail: aadvincu@umich.edu

Figure 1. Laparoscopic view of partially obliterated anterior cul-de-sac with uterine to anterior abdominal wall adhesions.

nating the fulcrum effect seen with conventional laparoscopy. A series of Endowrist instruments, such as DeBakey forceps and needle drivers, can be interchanged on either of the lateral robotic arms.

Recently, the application of robotic technology to facilitate minimally invasive surgery has increased. In numerous studies, it has been shown to be a safe and effective alternative to conventional laparoscopic surgery. In the gynecology literature are reports of robot-assisted laparoscopy for ovarian transposition, tubal reanastomosis, and hysterectomy.[6–10] Although a published report of robot-assisted laparoscopic hysterectomy already exists, all cases in that series were type IIB according to the American Association of Gynecologic Laparoscopists' (AAGL) classification system for laparoscopic hysterectomy.[11] This means that the posterior culdotomy and ligation of the cardinal and uterosacral ligament complexes were performed vaginally to complete the hysterectomy. Our hysterectomy series comprises either AAGL type IVE (totally laparoscopic removal of the uterus and cervix including vaginal cuff closure) or LSH III (totally laparoscopic supracervical hysterectomy with removal of the uterine corpus and division of the uterine arteries). We report on the application of robot-assisted laparoscopic hysterectomy to patients with a scarred or obliterated anterior cul-de-sac.

METHODS

A retrospective chart review for data abstraction was performed after obtaining approval from our Institutional Review Board (IRB #2003–0763). Six patients with suspected uterine to anterior abdominal wall adhesive disease who required hysterectomy for benign indications were recommended for a hysterectomy by robot-assisted laparoscopy. The suspected alteration in the anatomical operating field was thought to be a relative contraindication to conventional laparoscopy. A scarred or obliterated anterior cul-de-sac was confirmed by laparoscopy intraoperatively. In all patients, the suspected predisposing factor was previous cesarean delivery. The authors at the University of Michigan Medical Center performed all procedures between January 2002 and January 2003.

Operative Technique

All patients were placed in a low dorsal lithotomy position with arms padded and tucked at their sides after general endotracheal anesthesia was administered. The bladder was drained with a Foley catheter, and the stomach was evacuated with a nasogastric tube. A RUMI uterine manipulator was placed in conjunction with a Koh colpotomy ring and vaginal pneumo-occluder balloon. Pneumoperitoneum was obtained with a Veress needle followed by placement of 4 trocars. A 12-mm port was placed either at or above the umbilicus depending on the size of the uterus. This port accommodated the dual optical endoscope. Two 8-mm ports that mount directly to the operating arms on the patient-side cart were placed in the left and right lower quadrants, respectively. A fourth port served as an accessory port and was placed between the camera port and the right lower quadrant port. This was typically a 12-mm port to facilitate introduction of suture as well as instruments for retraction, suction/irrigation, and specimen removal.

Once all 4 ports were in place, the patient was placed in a steep Trendelenburg position, and the patient-side cart with robotic arms was brought between the patient's legs and docked. Each port was attached to the assigned robotic arm with the exception of the accessory port. The bedside surgeon, at the right side of the patient, was responsible for Endowrist instrument exchanges and any accessory port activity such as introduction of suture.

A survey of the operative field was performed and confirmation of a scarred or obliterated anterior cul-de-sac was made in all 6 patients. As a result of pelvic adhesive disease, attention was turned towards normalization of anatomy before initiation of the hysterectomy. A DeBakey forceps and round-tip scissors, both Endowrist instruments, were attached to the left and right operating arms respectively and used to perform the adhesiolysis. In cases where the anterior cul-de-sac was completely obliterated

by uterine to anterior abdominal wall adhesions or the vesico-uterine reflection was significantly scarred, the bladder was filled with 180mL to 240mL of methylene blue stained saline to facilitate dissection. When needed, an Endowrist instrument was exchanged for either a needle driver or monopolar cautery hook. Upon completion of the adhesiolysis, the approach to hysterectomy was carried out in a fashion analogous to the open surgical technique. All of the procedures were consistent with either AAGL type IVE or LSH III laparoscopic hysterectomies.[11] All vascular pedicles including the infundibulopelvic ligament and the uterine artery pedicles were skeletonized and subsequently suture ligated with either 0-Vicryl on CT-2 needles or free ties of 0-Vicryl before transection. Countertraction was provided by the bedside surgeon assistant through the accessory port with an atraumatic grasper. Adequate hemostasis was obtained with the combination of suture ligation and electrocautery. In cases where a total laparoscopic hysterectomy was intended, the monopolar cautery hook was utilized to divide the cardinal and uterosacral ligament complex bilaterally. Completion of both the anterior and posterior culdotomy was facilitated by the Koh colpotomy ring while upward uterine traction was provided by the bedside assistant. Pneumoperitoneum was maintained by inflation of the vaginal pneumo-occluder balloon. Once the uterus and cervix were completely detached, the specimen with or without adnexae was delivered into the vagina. The uterine fundus was used to maintain pneumoperitoneum during the closure of the vaginal cuff, which was closed with interrupted sutures of 0-Vicryl on CT-2 needles. All knots were tied intracorporeally. Once the vaginal cuff was closed, the specimen was removed from the vagina. A low-pressure check was performed to ensure hemostasis and the robot-assist device was undocked.

In cases where laparoscopic subtotal hysterectomy was intended, the monopolar cautery hook was used to amputate the uterine corpus below the internal os followed by extraction of the specimen through the accessory port with a tissue morcellator. The cervical stump was closed with interrupted sutures of 0-Vicryl on CT-2 needles.

RESULTS

We attempted 6 cases with zero conversions to laparotomy. Five patients underwent a total laparoscopic hysterectomy (AAGL type IVE), and one patient underwent a laparoscopic subtotal hysterectomy (AAGL type LSH III) in accordance with her wishes. Patients underwent hysterectomy for several benign indications **(Table 1)**. Three T1
patients also underwent a bilateral salpingo-oophorectomy.

The mean age was 39.8 years (range, 28 to 44). The mean body mass index was 26.0 kg/m^2 (range, 20.3 to 35.0). Estimated blood loss (EBL) was calculated by noting the difference between the volumes of aspirated and irrigated fluids. The mean estimated blood loss was 87.5mL (range, 50 to 150). No blood transfusions were administered in our series. The average uterine weight was 121.7g (range, 70 to 166.3). The mean operating time was 254 minutes (range, 170 to 368). The average hospital stay for all patients in our series was 1.3 days (range, 1 to 2).

The only complication in this series was one patient with

Table 1.
Preoperative and Intraoperative Data

Patient	Indication	Prior Pelvic Surgery	Robotic Procedure*
1	Chronic pelvic pain, endometriosis	Cesarean section × 3, tubal ligation, diagnostic laparoscopy, appendectomy	TLH
2	Abnormal uterine bleeding	Cesarean section × 5	TLH, BSO
3	Abnormal uterine bleeding	Cesarean section × 2, laparoscopic tubal ligation	TLH, BSO
4	Abnormal uterine bleeding	Cesarean section × 4	LSH
5	Symptomatic leiomyomata	Cesarean section × 2, laparoscopic tubal ligation	TLH
6	Abnormal uterine bleeding, dysmenorrhea	Cesarean section × 1	TLH, BSO

*BSO=bilateral salpingo-oophorectomy; TLH=total laparoscopic hysterectomy, AAGL type IV-E; LSH=laparoscopic subtotal hysterectomy, AAGL LSH III.

a delayed vaginal cuff hematoma that was managed conservatively. No cystotomies were performed.

DISCUSSION

Pelvic adhesions occur following the vast majority of surgical procedures. In fact, it has been recognized that pelvic adhesions occur in 55% to 95% of women following laparotomy.[12] This is true despite variables like meticulous surgical technique, laparoscopic approach, and the use of medical and surgical adjuvants. Although the cause of pelvic adhesions is not well known, several risk factors do exists. These include infection, tissue hypoxia or ischemia, tissue desiccation, trauma caused by rough handling of tissue during surgery, foreign body reaction, previous adhesiolysis, and the presence of intraperitoneal blood.[13] Many surgeons advocate closure of the peritoneum at the time of laparotomy as a way to avoid or minimize adhesion formation. As a result of this, closure or nonclosure of the peritoneum has been an area of debate in the literature. This study is not designed to address those issues.

The purpose of this study was to review our experience with applying robotic technology to laparoscopic hysterectomies suspected of having altered anatomy secondary to pelvic adhesive disease. Although the cases in our series could potentially have been completed by conventional laparoscopy, we believe that completion of these cases was greatly facilitated by the robotic system. Prior cesarean delivery (range, 1 to 5) was thought to be the key predisposing factor for the adhesions that were present in all 6 of these patients **(Table 1)**. Preoperatively, all of the patients in this study were suspected of having pelvic adhesions involving the anterior cul-de-sac based on physical examination findings.

Pathology involving the anterior aspect of the uterus has been known to pose difficulties to conventional laparoscopy. This is reported in laparoscopic myomectomies where anteriorly located leiomyomata are an important predictor of conversion to laparotomy and are poorly accessible to trocars, particularly when suturing.[14] The combination of 3-dimensional imaging and the mechanical-wrist instruments of the da Vinci Robotic Surgical System provided a means by which the altered anatomical operating field of the anterior cul-de-sac could be navigated. Lysis of adhesions as well as development of the vesicouterine reflection was readily accomplished without injury to the bladder or excessive blood loss.

One limitation of the system in its current form is the absence of tactile feedback (haptics) to the surgeon operating the Endowrist instruments remotely at the surgeon's console. Direct tactile sensation often is necessary during cases of difficult adhesiolysis. Despite this, the da Vinci Surgical System shows promise in this aspect of surgery. As technology evolves, this limitation will need to be addressed.

Although operative times were much longer than those in most published studies of conventional laparoscopic hysterectomy, blood loss, complication rates, and lengths of hospital stay were comparable if not better than those reported in other studies.[15–17] We attribute the vast majority of the increased operating time to the absence of tactile feedback and believe that with increasing experience, our operative time will decrease.

CONCLUSION

Although no absolute contraindications for laparoscopic hysterectomy exist, a surgeon's experience and the pathology encountered remain the limiting factors for performing laparoscopic hysterectomy.[5] Pathology in the form of pelvic adhesions can present a significant challenge to the surgeon attempting a hysterectomy with conventional laparoscopy. This is the first series to report the technique and outcome for robot-assisted laparoscopic hysterectomy in patients with scarred or obliterated anterior culs-de-sac. We believe that with the aide of robot-assisted technology, such as the da Vinci Robotic Surgical System, the limitations of conventional laparoscopy can be overcome. Our preliminary experience indicates that complex pathology can be managed in a minimally invasive fashion with robot-assisted laparoscopy. Despite these advancements in technology and surgical approach, issues like the absence of tactile feedback and cost will need to be addressed.

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KPMG

THE MIRIAM HOSPITAL

Financial Statements

September 30, 2005 and 2004

(With Independent Auditors' Report Thereon)

THE MIRIAM HOSPITAL

Financial Statements

September 30, 2005 and 2004

Table of Contents

KPMG LLP
600 Fleet Center
50 Kennedy Plaza
Providence, RI 02903-2321

Independent Auditors' Report

The Board of Trustees
The Miriam Hospital:

We have audited the accompanying statements of financial position of The Miriam Hospital (the Hospital) as of September 30, 2005 and 2004, and the related statements of operations and changes in net assets, and cash flows for the years then ended. These financial statements are the responsibility of the Hospital's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Hospital's internal control over financial reporting. Accordingly, we express no such opinion. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of The Miriam Hospital as of September 30, 2005 and 2004, and the results of its operations and changes in net assets, and its cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

KPMG LLP

December 9, 2005

THE MIRIAM HOSPITAL

Statements of Financial Position

September 30, 2005 and 2004

(In thousands)

Assets	2005	2004
Current assets:		
Cash and cash equivalents	$ 35,735	$ 23,352
Patient accounts receivable	36,956	34,944
Less allowance for doubtful accounts	(9,225)	(6,790)
Net patient accounts receivable	27,731	28,154
Other receivables	2,778	3,476
Total receivables	30,509	31,630
Assets limited as to use	717	728
Inventories	2,714	2,518
Prepaid expenses and other current assets	201	666
Total current assets	69,876	58,894
Interest in net assets of The Miriam Hospital Foundation	48,054	45,043
Assets limited as to use	96,317	84,205
Less amount required to meet current obligations	(717)	(728)
Noncurrent assets limited as to use	95,600	83,477
Property and equipment, net	82,280	73,861
Other assets:		
Deferred financing costs, net	1,239	1,316
Other noncurrent assets	1,166	1,545
Total other assets	2,405	2,861
Total assets	$ 298,215	$ 264,136

Liabilities and Net Assets	2005	2004
Current liabilities:		
Accounts payable	$ 7,206	$ 6,713
Accrued employee benefits and compensation	14,012	12,131
Other accrued expenses	2,713	2,984
Current portion of long-term debt	1,157	1,096
Current portion of estimated third-party payor settlements	13,124	8,136
Estimated health care benefit self-insurance costs	1,489	1,158
Total current liabilities	39,701	32,218
Long-term debt, net of current portion	50,355	51,500
Estimated third-party payor settlements, net of current portion	12,376	12,050
Other liabilities	5,859	6,396
Total liabilities	108,291	102,164
Net assets:		
Unrestricted	163,730	136,860
Temporarily restricted	20,380	19,678
Permanently restricted	5,814	5,434
Total net assets	189,924	161,972
Total liabilities and net assets	$ 298,215	$ 264,136

See accompanying notes to financial statements.

THE MIRIAM HOSPITAL

Statements of Operations and Changes in Net Assets

Years ended September 30, 2005 and 2004

(In thousands)

	2005	2004
Unrestricted revenues and other support:		
Net patient service revenue	$ 267,089	$ 242,344
Other revenue	13,034	10,698
Endowment earnings contributed toward community benefit	512	493
Net assets released from restrictions used for operations	1,027	937
Net assets released from restrictions used for research	21,520	24,414
Total unrestricted revenues and other support	303,182	278,886
Operating expenses:		
Compensation and benefits	140,896	133,801
Supplies and other expenses	82,732	74,210
Purchased services	32,271	30,394
Provision for bad debts	19,492	14,384
Depreciation and amortization	7,978	8,044
Interest	3,083	3,135
License fees	6,623	6,561
Total operating expenses	293,075	270,529
Income from operations	10,107	8,357
Nonoperating gains and losses:		
Net realized gains on sales of investments	4,579	2,607
Other nonoperating gains (losses)	26	(128)
Total nonoperating gains, net	4,605	2,479
Excess of revenues over expenses	$ 14,712	$ 10,836

(Continued)

THE MIRIAM HOSPITAL

Statements of Operations and Changes in Net Assets (Continued)

Years ended September 30, 2005 and 2004

(In thousands)

	2005	2004
Unrestricted net assets:		
Excess of revenues over expenses	$ 14,712	$ 10,836
Other changes in unrestricted net assets:		
Net unrealized gains on investments	3,487	3,230
Net assets released from restrictions used for purchase of property and equipment	4,881	1,148
Increase in interest in net assets of The Miriam Hospital Foundation	3,790	1,452
Transfers from affiliates, net	—	116
Increase in unrestricted net assets	26,870	16,782
Temporarily restricted net assets:		
Gifts, grants and bequests	25,152	26,713
Income from restricted investments	154	106
(Decrease) increase in interest in net assets of The Miriam Hospital Foundation	(1,159)	4,030
Transfers from The Miriam Hospital Foundation	4,142	1,250
Net assets released from restrictions	(27,428)	(26,499)
Net unrealized (losses) gains on investments	(159)	3
Increase in temporarily restricted net assets	702	5,603
Permanently restricted net assets:		
Increase in interest in net assets of The Miriam Hospital Foundation	380	1,246
Increase in net assets	27,952	23,631
Net assets, beginning of year	161,972	138,341
Net assets, end of year	$ 189,924	$ 161,972

See accompanying notes to financial statements.

THE MIRIAM HOSPITAL

Statements of Cash Flows

Years ended September 30, 2005 and 2004

(In thousands)

	2005	2004
Cash flows from operating activities:		
Increase in net assets	$ 27,952	$ 23,631
Adjustments to reconcile increase in net assets to net cash provided by (used in) operating activities:		
Net realized and unrealized gains on investments	(7,907)	(5,840)
Transfers from affiliates, net	—	(116)
Undistributed portion of change in interest in net assets of The Miriam Hospital Foundation	(3,011)	(6,728)
Transfers from The Miriam Hospital Foundation	(4,142)	(1,250)
Temporarily restricted gifts, grants and bequests	(25,152)	(26,713)
Depreciation and amortization	7,978	8,044
Provision for estimated health care benefit self-insurance costs	14,308	12,334
Decrease in liabilities for estimated health care benefit self-insurance costs resulting from claims paid	(13,977)	(11,998)
Net decrease (increase) in patient accounts receivable	423	(1,221)
Increase in accounts payable	493	311
Increase in accrued employee benefits and compensation	1,881	547
(Decrease) increase in other accrued expenses	(271)	661
Increase in estimated third-party payor settlements	5,314	2,742
Decrease in all other current and noncurrent assets	1,358	1,700
(Decrease) increase in other liabilities	(537)	2,645
Net cash provided by (used in) operating activities	4,710	(1,251)
Cash flows from investing activities:		
Purchase of property and equipment	(16,320)	(16,774)
Net decrease (increase) in trustee-held bond funds	8	(696)
Other net increases in assets limited as to use	(4,213)	(3,539)
Net cash used in investing activities	(20,525)	(21,009)
Cash flows from financing activities:		
Payments on long-term debt	(1,096)	(1,048)
Temporarily restricted gifts, grants and bequests	25,152	26,713
Net transfers from The Miriam Hospital Foundation	4,142	1,250
Net cash provided by financing activities	28,198	26,915
Net increase in cash and cash equivalents	12,383	4,655
Cash and cash equivalents, beginning of year	23,352	18,697
Cash and cash equivalents, end of year	$ 35,735	$ 23,352
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ 3,090	$ 3,139

See accompanying notes to financial statements.

(1) Description of Organization and Summary of Significant Accounting Policies

(a) Organization

The Miriam Hospital (the Hospital), located in Providence, Rhode Island, is a 247-bed nonprofit general acute care teaching hospital with university affiliation providing a comprehensive range of diagnostic and therapeutic services (excluding obstetrics) for the acute care of patients principally from Rhode Island and southeastern Massachusetts. As a complement to its role in service and education, the Hospital actively supports research. The Hospital is accredited by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and participates as a provider primarily in Medicare, Blue Cross and Medicaid programs. The Hospital is also a member of Voluntary Hospitals of America, Inc. (VHA).

Effective August 9, 1994, the Federal Trade Commission and the Health Services Council of the Rhode Island Department of Health approved the combination of the Hospital and Rhode Island Hospital (RIH) of Providence, RI (719 beds) under a plan which included the creation of a not-for-profit parent company, Lifespan Corporation (Lifespan). Each hospital continues to maintain its own identity and Board of Trustees, as well as its own campus and its own name. Lifespan has the responsibility for strategic planning and initiatives, capital and operating budgets, and overall governance of the consolidated organization. The transaction was accounted for as a pooling of interests at the Lifespan level.

(b) Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

(c) Cash and Cash Equivalents

Cash and cash equivalents include all highly liquid debt instruments with maturities of three months or less when purchased, excluding amounts limited as to use by board-designation or other arrangements under trust agreements.

(Continued)

(1) Description of Organization and Summary of Significant Accounting Policies (continued)

(d) Investments and Investment Income

Investments in equity securities with readily determinable fair values and all investments in debt securities are measured at fair value in the statements of financial position. Investments in collective investment funds are measured based on the fair value of the underlying investments. Investments of 5% or more in limited partnerships, limited liability corporations or similar investments are accounted for at fair value, with changes in fair value recorded as realized gains or losses using the equity method. Investments in derivative financial instruments are not material.

Investment income or loss (including realized gains and losses on investments, interest and dividends) is included in the excess of revenues over expenses unless the income or loss is restricted by donor or law. Unrealized gains and losses on investments other than those accounted for using the equity method are excluded from the excess of revenues over expenses.

Realized gains or losses on sales of investments are determined by the average cost method. Realized gains or losses on unrestricted investments are recorded as nonoperating gains or losses; realized gains or losses on restricted investments are recorded as an addition to or deduction from the appropriate restricted net assets. A decline in the market value of an investment security below its cost that is designated to be other than temporary is recognized through an impairment charge classified as a realized loss and a new cost basis is established.

Investment income from trustee-held funds under bond indenture agreements is recorded as other revenue. Lifespan maintains a spending policy for certain board-designated funds of its patient care affiliates which provides that investment income from such funds is recorded within unrestricted revenues as endowment earnings contributed toward community benefit.

(e) Assets Limited As To Use

Assets limited as to use primarily include assets set aside by the Hospital's Board for future capital improvements, over which the Board retains control and may at its discretion subsequently use for other purposes, and assets whose use by the Hospital has been limited by grantors or donors to a specific purpose, as well as trustee-held funds under bond indenture agreements.

(Continued)

(1) Description of Organization and Summary of Significant Accounting Policies (continued)

(f) Property and Equipment

Property and equipment acquisitions are recorded at cost. Depreciation is computed over the estimated useful life of each class of depreciable asset using the straight-line method. Buildings and improvements lives range from 5 to 40 years and equipment from 3 to 20 years.

(g) Deferred Financing Costs

Deferred financing costs, which relate to the issuance of long-term bonds payable to the Rhode Island Health and Educational Building Corporation (RIHEBC), are being amortized ratably over the periods the bonds are outstanding.

(h) Temporarily Restricted Net Assets

Temporarily restricted net assets are those whose use by the Hospital has been limited by grantors or donors to a specific purpose, including research activities.

(i) Excess of Revenues Over Expenses

The statements of operations and changes in net assets include excess of revenues over expenses. Changes in unrestricted net assets which are excluded from excess of revenues over expenses, consistent with industry practice, include unrealized gains and losses on investments, change in interest in net assets of The Miriam Hospital Foundation, net assets released from restrictions used for purchase of property and equipment, and permanent transfers of assets from affiliates for other than goods and services.

(j) Net Patient Service Revenue

The Hospital provides care to patients under Medicare, Medicaid, health maintenance organization (HMO) and commercial insurance contractual arrangements. The Hospital has agreements with many third-party payors that provide for payments to the Hospital at amounts less than its established rates. Net patient service revenue is reported at the estimated net realizable amounts from patients, third-party payors, and others for services rendered, including estimated retroactive adjustments under reimbursement agreements with some third-party payors.

Medicare utilizes a prospective payment system for most inpatient hospital services rendered to Medicare program beneficiaries based on the classification of each case into a diagnostic-related group (DRG). Medicare outpatient hospital services are primarily paid using an ambulatory payment classification system.

(Continued)

(1) Description of Organization and Summary of Significant Accounting Policies (continued)

Inpatient hospital services to Rhode Island Medicaid patients are reimbursed based on negotiated costs under a prospective cost arrangement. The tentative hospital reimbursement rates are determined by certain negotiated budgeted expenditures and budgeted volume. Variances from budgeted volume are reimbursable at rates which may differ from the budgeted rate.

The majority of payments from HMO's and commercial insurance companies are based upon negotiated fixed pricing arrangements, whereby a combination of per diem rates and specific case rates are utilized for inpatient services, along with fixed fees applicable to outpatient services.

Settlements and adjustments arising under reimbursement arrangements with some third-party payors, primarily Medicare, Medicaid and Blue Cross, are accrued on an estimated basis in the period the related services are rendered and adjusted in future periods as final settlements are determined. The Hospital has classified a portion of accrued estimated third-party payor settlements as long-term because such amounts, by their nature or by virtue of regulation or legislation, will not be paid within one year. Changes in the Medicare and Medicaid programs, such as the reduction of reimbursement, could have an adverse impact on the Hospital.

(k) Provision for Bad Debts

The Hospital grants credit without collateral to its patients, most of whom are local residents and are insured under third-party payor arrangements. Additions to the allowance for doubtful accounts are made by means of the provision for bad debts. Accounts deemed uncollectible are deducted from the allowance and subsequent recoveries are added. The amount of the provision for bad debts is based upon management's assessment of historical and expected net collections, business and economic conditions, trends in federal and state governmental health care coverage and other collection indicators.

(l) Charity Care

The Hospital provides care to patients who meet certain criteria under its charity care policy without charge or at amounts less than its established rates. Because the Hospital does not pursue collection of amounts determined to qualify as charity care, they are not reported as net patient service revenue.

(m) Donor-Restricted Gifts

Unconditional promises to give cash and other assets to the Hospital are reported at fair value at the date the promise is received. The gifts are reported as temporarily restricted support that increases the net asset class if they are received with stipulations that limit the use of the assets. When a donor or grantor restriction expires, that is, when a stipulated purpose restriction is accomplished, temporarily restricted net assets are reclassified as unrestricted net assets and reported in the statements of operations and changes in net assets as net assets released from restrictions.

(Continued)

(1) Description of Organization and Summary of Significant Accounting Policies (continued)

(n) Inventories

Inventories, consisting primarily of medical/surgical supplies and pharmaceuticals, are stated at the lower of cost or market.

(o) Estimated Self-Insurance Costs

The Hospital provides self-insured health benefit options to its employees. The Hospital has recorded a provision for estimated claims, which is based on Lifespan's own experience. The provision for self-insured losses includes estimates of the ultimate costs for both reported claims and claims incurred but not yet reported.

(p) Fair Value of Financial Instruments

The carrying amounts recorded in the statements of financial position for cash and cash equivalents, patient accounts receivable, assets limited as to use, accounts payable, accrued expenses, estimated third-party payor settlements, and estimated health care benefit self-insurance costs approximate their respective fair values. The estimated fair value of the Hospital's long-term debt is disclosed in Note 9.

(q) New Accounting Pronouncement

In March 2005, the Financial Accounting Standards Board (FASB) issued FASB Interpretation No. 47 (FIN 47), *Accounting for Conditional Asset Retirement Obligations*, which clarifies that a liability (at fair value) must be recognized for an asset retirement obligation when it has been incurred if the amount can be reasonably estimated, even if settlement of the liability is conditional on a future event. FIN 47 is effective for fiscal years ending after December 15, 2005. During 2006, the Hospital will review its asset retirement obligations to determine the need to record a liability to cover any conditional obligation.

(r) Reclassifications

Certain 2004 amounts have been reclassified to conform with the 2005 reporting format.

(Continued)

(In thousands)

(2) Disproportionate Share

The Hospital is a participant in the State of Rhode Island's Disproportionate Share Program, established in 1995 to assist hospitals which provide a disproportionate amount of uncompensated care. Under the program, Rhode Island hospitals, including the Hospital, receive federal and state Medicaid funds as additional reimbursement for treating a disproportionate share of low income patients. Total payments to the Hospital under the Disproportionate Share Program aggregated $6,015 and $8,666 in 2005 and 2004, respectively, and are reflected as part of net patient service revenue in the accompanying statements of operations and changes in net assets.

The State of Rhode Island has assessed a license fee to all Rhode Island hospitals, based on each hospital's 2003 gross patient service revenue. The Hospital's license fee expense was $6,623 and $6,561 in 2005 and 2004, respectively. The hospitals in the State of Rhode Island accepted the fee as part of an agreement with the State's Department of Health and Human Services in return for an equitable distribution of funds to those hospitals meeting certain criteria in providing services to the Medicaid population.

For periods beyond 2006, the federal government could change the level of federal matching funds for the Disproportionate Share Program. Accordingly, it may be necessary for the State of Rhode Island to modify the program and the reimbursement to Rhode Island hospitals under the program. At this time, the scope of such modifications or their effect on the Hospital cannot be reasonably determined.

(3) Charity Care and Community Services

The Hospital maintains records to identify and monitor the level of charity care it provides. These records include the amount of charges forgone for services and supplies furnished under its charity care policy and the estimated cost of those services and supplies.

In March 2004, the Hospital increased the minimum gross salary levels for qualification as charity care to twice the level of poverty guidelines published in the Federal Register. The following information measures the level of charity care provided by the Hospital during the years ended September 30:

	2005	2004
Charges forgone, based on established rates	$ 12,383	$ 6,439
Estimated costs and expenses incurred to provide charity care	$ 3,457	$ 1,909

The Hospital also provides numerous other services to the community for which charges are not generated. These services include certain emergency services, community health screenings, health/medical education, patient advocacy, foreign language translation and physician referral services.

(Continued)

(In thousands)

(3) Charity Care and Community Services (continued)

The Hospital subsidizes the cost of treating patients who receive government assistance where reimbursement is below cost.

Administrative uncompensated care, based on charges, amounted to $2,972 and $2,626 in 2005 and 2004, respectively. The related cost of such care approximated $830 and $778 in 2005 and 2004, respectively.

In addition to the cost of charity care and other community service programs, the Hospital provided $19,492 and $14,384 for uncollectible patient accounts, based on charges net of contractual allowances, during the years ended September 30, 2005 and 2004, respectively. The cost associated with such provisions approximated $5,442 and $4,263 in 2005 and 2004, respectively.

(4) Investments

The composition of assets limited as to use at September 30, 2005 and 2004 is set forth in the following table.

	2005	2004
Internally board-designated:		
U.S. government and agency obligations	$ 3,955	$ 3,578
Corporate equity securities	24,977	21,885
Corporate obligations	5,481	6,202
Collective investment funds	47,575	40,226
	81,988	71,891
Held by trustee under bond indenture agreements:		
Cash and short-term investments	723	730
Corporate obligations	576	180
U.S. government and agency obligations	905	1,302
	2,204	2,212
Temporarily restricted funds:		
Collective investment funds	12,125	10,102
Total	$ 96,317	$ 84,205

(Continued)

(In thousands)

(4) Investments (continued)

Investment income and gains (losses) for cash equivalents and assets limited as to use are comprised of the following for the years ended September 30:

	2005	2004
Other revenue:		
Investment income	$ 2,277	$ 1,399
Endowment earnings contributed toward community benefit:		
Dividend and interest income	$ 512	$ 493
Nonoperating gains and losses:		
Net realized gains on sales of investments	$ 4,579	$ 2,607
Other changes in unrestricted net assets:		
Net unrealized gains on investments	$ 3,487	$ 3,230
Changes in temporarily restricted net assets:		
Income from restricted investments	$ 154	$ 106
Net unrealized (losses) gains on investments	(159)	3
	$ (5)	$ 109

The following criteria are considered in determining other than temporary declines in the fair market value of individual investments:

- The unrealized loss must be present for at least a nine-month period, with a fair market value/cost ratio of less than 75% at both the beginning and end of the period.
- Investments with a fair market value/cost ratio of 25% or less are written down immediately.
- Investments for which the manager has increased the position by at least 20% in the last nine months are not adjusted unless the fair market value/cost ratio is 25% or less; otherwise, these investments are monitored for possible adjustment in future periods.
- Investments whose fair market value/cost ratio is below 75% at the beginning of a nine-month period but above 65% at the end of said period are not adjusted but rather monitored for possible adjustment in future periods.

(Continued)

(In thousands)

(4) Investments (continued)

Information regarding investments with unrealized losses at September 30, 2005 and 2004 is presented below, segregated between those that have been in a continuous unrealized loss position for less than twelve months and those that have been in a continuous unrealized loss position for twelve or more months:

	Less than 12 months		12 months or longer		Total	
September 30, 2005:	Fair value	Unrealized losses	Fair value	Unrealized losses	Fair value	Unrealized losses
Internally board-designated funds:						
U.S government and agency obligations	$ 4,912	$ 89	$ 392	$ 15	$ 5,304	$ 104
Corporate obligations	2,430	57	400	13	2,830	70
Total debt securities	7,342	146	792	28	8,134	174
Corporate equity securities	3,161	323	1,010	224	4,171	547
Total temporarily impaired securities	$ 10,503	$ 469	$ 1,802	$ 252	$ 12,305	$ 721

	Less than 12 months		12 months or longer		Total	
September 30, 2004:	Fair value	Unrealized losses	Fair value	Unrealized losses	Fair value	Unrealized losses
Internally board-designated funds:						
U.S government and agency obligations	$ 2,545	$ 9	$ 92	$ 2	$ 2,637	$ 11
Corporate obligations	1,249	17	309	11	1,558	28
Total debt securities	3,794	26	401	13	4,195	39
Corporate equity securities	2,409	309	509	147	2,918	456
Total temporarily impaired securities	$ 6,203	$ 335	$ 910	$ 160	$ 7,113	$ 495

(Continued)

(In thousands)

(4) Investments (continued)

The following table sets forth changes in internally board-designated investments for the years ended September 30, 2005 and 2004:

	2005	2004
Internally board-designated investments at beginning of year	$ 71,891	$ 64,307
Investment income:		
Dividend and interest income	2,031	1,747
Net realized gains on sales of securities	4,579	2,607
Net unrealized gains on investments	3,487	3,230
Internally board-designated investments at end of year	$ 81,988	$ 71,891

(5) Property and Equipment

Property and equipment, by major category, is as follows at September 30:

	2005	2004
Land and improvements	$ 4,711	$ 4,711
Buildings and improvements	78,907	75,193
Equipment	94,797	88,590
	178,415	168,494
Less accumulated depreciation and amortization	111,675	103,808
	66,740	64,686
Construction in progress	15,540	9,175
Property and equipment, net	$ 82,280	$ 73,861

Depreciation and amortization expense for the years ended September 30, 2005 and 2004 amounted to $7,978 and $8,044, respectively.

The estimated additional cost of completion of construction in progress approximated $48,305 on September 30, 2005, comprised mainly of various building renovation projects. In addition, the Hospital has several building renovation projects pending contractual commitments with an estimated cost of completion of $60,532.

(Continued)

(5) Property and Equipment (continued)

It is the Hospital's policy to capitalize the net amount of interest cost associated with significant capital additions as a component of the cost of such assets, which is amortized over the asset's estimated useful life. No interest was capitalized in 2005 and 2004.

(6) Pension and Other Postretirement Benefits

Pension Benefits

Lifespan Corp. sponsors the Lifespan Corporation Retirement Plan (the Plan), which was established effective January 1, 1996 when the Rhode Island Hospital Retirement Plan merged into The Miriam Hospital Retirement Plan (the TMH Plan). Upon completion of the merger, the new plan was renamed and is governed by provisions of the Lifespan Corporation Retirement Plan. Each employee who was a participant in the TMH Plan and was an eligible employee on January 1, 1996 continues to be a participant on and after January 1, 1996, subject to the provisions of the Plan. Employees are included in the Plan on the first of the month which is the later of their first anniversary of employment and the attainment of age 18.

The Plan is intended to constitute a plan described in Section 414(k) of the Internal Revenue Code, under which benefits are derived from employer contributions based on the separate account balances of participants in addition to the defined benefits provided under the Plan, which are based on an employee's years of credited service and annual compensation. Lifespan's funding policy is to contribute amounts to the Plan sufficient to meet minimum funding requirements set forth in the Employee Retirement Income Security Act of 1974, plus such additional amounts as may be determined to be appropriate by Lifespan.

Substantially all employees of Lifespan Corporation who meet the above requirements are eligible to participate in the Plan. Lifespan uses a measurement date of June 30 for the Plan.

(Continued)

(In thousands)

(6) Pension and Other Postretirement Benefits (continued)

Benefit Obligations

	2005	2004
Change in benefit obligation:		
Benefit obligation, beginning of year	$ 303,766	$ 280,093
Service cost	17,743	16,869
Interest cost	19,607	17,661
Benefits paid	(14,310)	(12,125)
Administrative expenses	(1,092)	(765)
Actuarial loss	37,296	1,120
Plan amendment	—	913
Projected benefit obligation at end of year	$ 363,010	$ 303,766

The accumulated benefit obligation at the end of 2005 and 2004 was $306,904 and $261,624, respectively.

The following assumptions were used to determine end of year benefit obligations:

	2005	2004
Weighted-average discount rate	5.0%	6.25%
Rate of increase in future compensation levels	4.5%	4.5%

Plan Assets

	2005	2004
Change in plan assets:		
Fair value of plan assets, beginning of year	$ 241,427	$ 206,185
Actual return on plan assets	22,857	31,673
Employer contributions	16,237	16,459
Administrative expenses	(1,092)	(765)
Benefits paid	(14,310)	(12,125)
Fair value of plan assets, end of year	$ 265,119	$ 241,427

Employer contributions and benefits paid in the above table include only those amounts contributed directly to or paid directly from Plan assets.

(Continued)

(In thousands)

(6) **Pension and Other Postretirement Benefits (continued)**

The asset allocation for the Plan at June 30, 2005 and 2004, and the target allocation for 2006, by asset category, are as follows:

Asset Category	Target Allocation 2006	Percentage of Plan Assets at Year End 2005	2004
U.S. equity	25-45%	26.7%	33.1%
Absolute return	0-10%	7.9%	7.8%
International equity	10-30%	22.9%	25.0%
Venture capital	0-10%	1.8%	2.1%
Commodities	0-10%	10.1%	1.8%
Real estate	0-15%	8.0%	7.0%
Fixed income	20-30%	19.5%	20.9%
Cash and cash equivalents	0-10%	3.1%	2.3%
Total		100.0%	100.0%

The above table does not include $48,676 and $45,107 of Plan assets at June 30, 2005 and 2004, respectively, attributable to the separate savings account balances of participants which are managed in various mutual funds by Fidelity Investments.

The overall financial objective of the Plan is to meet present and future obligations to beneficiaries, while minimizing long-term contributions to the Plan (by earning an adequate return on Plan assets), with moderate volatility in year-to-year contribution levels.

The primary investment objective of the Plan is to provide a satisfactory return on investment in support of the above objective. The Plan's specific investment objective is to attain an average annual real total return (net of investment management fees) of at least 5% over the long term (rolling five-year periods). Real total return is the sum of capital appreciation (or loss) and current income (dividends and interest) adjusted for inflation by the Consumer Price Index.

(Continued)

(In thousands)

(6) Pension and Other Postretirement Benefits (continued)

Funded Status

The funded status of the Plan, reconciled to the amount reported on the statements of financial position, follows:

	2005	2004
Fair value of plan assets	$ 265,119	$ 241,427
Benefit obligations	363,010	303,766
Funded status	(97,891)	(62,339)
Unrecognized net loss from past experience different from that assumed	62,506	31,388
Prior service cost not yet recognized in net periodic pension cost	6,693	7,690
Unrecognized net transition assets	—	(137)
Net pension liability recognized in Lifespan's consolidated statements of financial position	$ (28,692)	$ (23,398)
Net pension liability recognized in the Hospital's statements of financial position	$ (6,741)	$ (5,632)

The net pension liability recognized in the statements of financial position at September 30, 2005 and 2004 consists of:

	2005	2004
Current (included in accrued employee benefits and compensation)	$ 3,319	$ 1,701
Noncurrent (included in other liabilities)	3,422	3,931
Total	$ 6,741	$ 5,632

(Continued)

(In thousands)

(6) Pension and Other Postretirement Benefits (continued)

At the end of 2005 and 2004, the projected benefit obligation, accumulated benefit obligation, and fair value of Plan assets were as follows:

	2005	2004
Projected benefit obligation	$ 363,010	$ 303,766
Accumulated benefit obligation	306,904	261,624
Fair value of plan assets	265,119	241,427

Expected Cash Flows

Information about the expected cash flows for the Plan follows:

Employer Contributions:	
2006 (expected)	$ 18,000
Expected Benefit Payments:	
2006	$ 15,400
2007	15,500
2008	15,600
2009	16,600
2010	16,800
2011-2015	99,100

Management evaluates its Plan assumptions annually and the expected contribution in 2006 could increase.

(Continued)

(In thousands)

(6) Pension and Other Postretirement Benefits (continued)

Net Periodic Pension Cost

Components of net periodic pension cost are as follows for the years ended September 30:

	2005	2004
Service cost	$ 17,743	$ 16,869
Interest cost	19,607	17,661
Expected return on plan assets	(18,922)	(17,194)
Net amortization and deferral	3,103	4,166
Net periodic pension cost for Lifespan	$ 21,531	$ 21,502
Net periodic pension cost for the Hospital	$ 4,117	$ 3,976

The following assumptions were used to determine net periodic pension cost:

	2005	2004
Weighted-average discount rate	6.25%	6.0%
Expected long-term rate of return on plan assets	8.0%	8.5%
Rate of increase in future compensation levels	4.5%	4.5%

Lifespan employs a rigorous process to annually determine the expected long-term rate of return on Plan assets which is only changed based on significant shifts in economic and financial market conditions. These estimates are primarily driven by actual historical asset-class returns along with our long-term outlook for a globally diversified portfolio. Asset allocations are regularly updated based on evaluations of future market returns for each asset class.

Other Postretirement Benefits

In addition to providing pension benefits, the Hospital provides certain health care benefits for retired employees. Under Statement of Financial Accounting Standards No. 106, the cost of postretirement benefits other than pensions must be recognized on an accrual basis as employees perform services to earn the benefits.

(Continued)

(In thousands)

(6) Pension and Other Postretirement Benefits (continued)

Benefit Obligations

Change in benefit obligation:	2005	2004
Benefit obligation, beginning of year	$ 2,824	$ 3,093
Service cost	111	211
Interest cost	117	185
Benefits paid	(47)	(36)
Actuarial gain	(350)	(300)
Plan amendment	(1,881)	(329)
Benefit obligation, end of year	$ 774	$ 2,824

The following assumptions were used to determine end of year benefit obligations:

	2005	2004
Weighted-average discount rate	5.0%	6.25%

Funded Status

The Hospital has never funded its postretirement benefit obligations. The funded status of the postretirement benefit plan, reconciled to the amount reported on the statements of financial position, follows:

	2005	2004
Benefit obligations	$ 774	$ 2,824
Funded status	(774)	(2,824)
Unrecognized net loss from past experience different from that assumed	756	1,000
Prior service (benefit) cost not yet recognized in net periodic postretirement benefit cost	(1,845)	15
Accrued postretirement benefit cost recognized in the statements of financial position	$ (1,863)	$ (1,809)

(Continued)

(In thousands)

(6) Pension and Other Postretirement Benefits (continued)

The accrued postretirement benefit cost recognized in the statements of financial position at September 30, 2005 and 2004 consists of:

	2005	2004
Current (included in accrued employee benefits and compensation)	$ 37	$ 34
Noncurrent (included in other liabilities)	1,826	1,775
Total	$ 1,863	$ 1,809

Expected Cash Flows

Information about the expected cash flows for the postretirement benefit plan follows:

Expected Benefit Payments:	
2006	$ 46
2007	49
2008	53
2009	60
2010	67
2011-2015	438

Net Periodic Postretirement Benefit Cost

Components of net periodic postretirement benefit cost are as follows for the years ended September 30:

	2005	2004
Service cost	$ 111	$ 211
Interest cost	117	185
Amortization of prior service (benefit) cost	(204)	58
Amortization of actuarial loss	76	25
Net periodic postretirement benefit cost	$ 100	$ 479

The following assumptions were used to determine net periodic postretirement benefit cost:

	2005	2004
Weighted-average discount rate	6.25%	6.0%

(Continued)

(In thousands)

(6) Pension and Other Postretirement Benefits (continued)

For measurement purposes, a 10% annual rate of increase in the per capita cost of covered health care benefits was assumed for 2005. The rate was assumed to decrease gradually to 5% by 2015 and remain at that level thereafter. The health care cost trend rate assumption has a significant effect on the amounts reported. To illustrate, increasing the assumed health care cost trend rate one-percentage-point each year would increase the accumulated postretirement benefit obligation as of September 30, 2005 by $102 and the aggregate of the service and interest cost components of net periodic postretirement benefit cost for 2005 by $32.

As of December 31, 2004, health care postretirement benefits have been eliminated for all active employees of the Hospital who have not attained age 55 and completed five years of consecutive service.

(7) Patient Service Revenue and Related Reimbursement

A major portion of the Hospital's revenue is received from third-party payors. The following is an approximate percentage breakdown of gross patient service revenue by payor type for the years ended September 30:

	2005	2004
Medicare	31%	31%
Blue Cross	22	23
Medicaid	4	4
Managed Care	36	34
Commercial, self-pay and other	7	8
	100%	100%

The Hospital grants credit to patients, most of whom are local residents. The Hospital generally does not require collateral or other security in extending credit to patients; however, it routinely obtains assignment of (or is otherwise entitled to receive) patients' benefits payable under their health insurance programs, plans or policies (e.g., Medicare, Medicaid, Blue Cross, health maintenance organizations, and commercial insurance policies).

Cost reports filed annually with third-party payors are subject to audit prior to final settlement. The 2005 cost reports have not been filed and, therefore, not settled with either Medicare or Medicaid. In addition, the Medicare and Medicaid cost reports for 2003 and 2004 have not been settled.

(Continued)

(7) Patient Service Revenue and Related Reimbursement (continued)

Regulations in effect require annual settlements based upon cost reports filed by the Hospital. These settlements are estimated and recorded in the accompanying financial statements. Changes in these estimates are reflected in the financial statements in the year in which they occur. Net patient service revenue in the accompanying statements of operations and changes in net assets was increased by $164 and $866 in 2005 and 2004, respectively, to reflect changes in the estimated settlements for certain prior years.

In addition, in 2004 the Hospital's net patient service revenue was increased by $1,059, representing the Hospital's share of a $7,000 payment made by Blue Cross to all Rhode Island hospitals. This payment was part of a $21,000 distribution by Blue Cross to Rhode Island hospitals, physicians and subscribers. It is unknown if a similar type of payment will be made in future years.

Revenues from Medicare and Medicaid programs accounted for approximately 31% and 4%, respectively, of the Hospital's gross patient service revenue for the year ended September 30, 2005. Laws and regulations governing the Medicare and Medicaid programs are complex and subject to interpretation. The Hospital believes that it is in compliance with all applicable laws and regulations. Compliance with laws and regulations can be subject to future government review and interpretation as well as significant regulatory action; failure to comply with such laws and regulations can result in fines, penalties and exclusion from Medicare and Medicaid programs.

(8) Income Tax Status

The Hospital is a not-for-profit corporation as described in Section 501(c)(3) of the Internal Revenue Code (the Code) and is exempt from Federal income taxes pursuant to Section 501(a) of the Code.

(Continued)

(In thousands)

(9) Long-Term Debt

Long-term debt consists of the following at September 30:

	2005	2004
Hospital Financing Revenue fixed rate serial and term bonds due May 15, 2006 through 2026 in annual amounts ranging from $4,970 to $14,705 at rates ranging from 5.2% to 5.75% (1996 Series—Lifespan Obligated Group—the Hospital and RIH)	$ 33,139	$ 33,961
Hospital Financing Revenue fixed rate serial and term bonds due August 15, 2006 through 2032 in annual amounts ranging from $1,150 to $5,555 at rates ranging from 5% to 6.5% (2002 Series—Lifespan Obligated Group—the Hospital and RIH)	18,701	18,975
Total long-term debt	51,840	52,936
Less current portion	1,157	1,096
Less unamortized discount	328	340
Long-term debt, excluding current portion	$ 50,355	$ 51,500

The estimated fair value of the Hospital's long-term debt at September 30, 2005 amounts to $54,845 and is estimated using discounted cash flow analyses, based on the Hospital's current incremental borrowing rates for similar types of borrowing arrangements.

On July 9, 2002, Rhode Island Health and Educational Building Corporation (RIHEBC) issued, on behalf of the Lifespan Obligated Group, which consists of the Hospital and RIH, $78,000 of tax-exempt bonds (the 2002 Bonds) to finance routine capital expenditures of the Hospital and RIH, renovations of the RIH emergency department and construction and equipping of a cancer center on the campus of RIH.

The above outstanding 2002 Hospital Financing Revenue Bonds (Lifespan Obligated Group—the Hospital and RIH) are secured by mortgage liens on the Hospital's and RIH's real property and all buildings, structures and improvements thereon. The Hospital and RIH are jointly and severally liable for repayment of the $78,000 2002 Bonds, $19,500 and $58,500 of which has been recorded directly by the Hospital and RIH, respectively.

(Continued)

(9) Long-Term Debt (continued)

On December 1, 1996, RIHEBC issued, on behalf of the Lifespan Obligated Group, $214,585 of tax-exempt bonds (the 1996 Bonds) to finance portions of Lifespan's, the Hospital's and RIH's 1996, 1997, 1998 and 1999 expenditures for routine capital equipment and facility renovation/replacement, and to advance refund $8,455 of the Hospital's 1989 Series A bonds, $1,900 of the Hospital's 1992 Series A bonds and $10,065 of the Hospital's 1992 Series B bonds. A total of $20,580 of the net proceeds from the 1996 bond issue and $1,004 of the refunded bonds' unspent debt service funds was deposited into a trust fund for the purpose of this refunding. The principal balance outstanding on the Hospital's refunded bonds, which are considered extinguished, was $14,745 at September 30, 2005. The trust is held by an independent trustee and is invested in obligations of the United States Government which mature and bear interest in such amounts and at such times as will be sufficient to pay the principal and interest as it comes due on the Hospital's refunded bonds.

The above outstanding 1996 Hospital Financing Revenue Bonds (Lifespan Obligated Group—the Hospital and RIH) are secured by a pledge of the gross receipts of the Hospital and RIH. The Hospital and RIH are jointly and severally liable for repayment of the $214,585 1996 Bonds, $37,552 and $177,033 of which has been recorded directly by the Hospital and RIH, respectively. Payment of the principal and interest on the 1996 Bonds when due is guaranteed by a financial guaranty insurance policy issued by MBIA Insurance Corporation.

Under the terms of the 2002 and 1996 Bonds, the Hospital and RIH are required to satisfy certain measures of financial performance as long as the bonds are outstanding. At September 30, 2005, the Hospital and RIH were in compliance with all covenants of the bonds.

The Hospital's aggregate maturities of long-term debt for the five fiscal years ending in September 2010 are as follows: 2006, $1,157; 2007, $1,223; 2008, $1,292; 2009, $1,364 and 2010, $1,437.

Agreements underlying the Hospital Financing Revenue Bonds require that the Lifespan Obligated Group maintain certain trustee-held funds, included with assets limited as to use in the statements of financial position, as follows:

Bond Fund — The Lifespan Obligated Group is required to make quarterly deposits to the trustee sufficient to provide sinking funds for the payment of principal and interest to bondholders when due.

Debt Service Reserve Fund — The Lifespan Obligated Group is required to apply monies in the Debt Service Reserve Fund to remedy deficiencies in the 2002 Bond Fund, if any.

(Continued)

(In thousands)

(9) Long-Term Debt (continued)

The balances of these trustee-held funds at September 30 are summarized as follows:

	2005	2004
Bond Funds	$ 717	$ 728
Debt Service Reserve Fund	1,487	1,484
Total	$ 2,204	$ 2,212

During the years ended September 30, 2005 and 2004, the Hospital's interest expense was $3,083 and $3,135, respectively. Interest paid was $3,090 and $3,139 during the years ended September 30, 2005 and 2004, respectively.

(10) Temporarily and Permanently Restricted Net Assets

Temporarily restricted net assets are available for the following purposes at September 30:

	2005	2004
Research	$ 10,431	$ 9,126
General health care service activities	3,515	2,959
Interest in net assets of The Miriam Hospital Foundation	6,434	7,593
Total	$ 20,380	$ 19,678

Permanently restricted net assets are restricted in perpetuity at September 30 and consist of the following:

	2005	2004
Interest in net assets of The Miriam Hospital Foundation	$ 5,814	$ 5,434

(Continued)

(In thousands)

(11) Leases

The Hospital leases equipment under various noncancelable operating lease agreements. Future minimum lease payments, by year and in the aggregate, under noncancelable operating leases with terms of one year or more consist of the following at September 30, 2005:

Year Ending September 30:	Amount
2006	$ 2,983
2007	2,412
2008	2,324
2009	2,294
2010	2,191
Total minimum lease payments	$ 12,204

Rental expense, including rentals under leases with terms of less than one year, for the years ended September 30, 2005 and 2004 was $4,575 and $3,983, respectively.

(12) Concentrations of Credit Risk

Financial instruments which potentially subject the Hospital to concentrations of credit risk consist primarily of accounts receivable and certain investments. The risk associated with temporary cash investments is mitigated by the fact that the investments are placed with what management believes are high credit quality financial institutions. Investments, which consist of government and agency obligations, stocks, and corporate bonds are not concentrated in any corporation or industry.

The Hospital receives a significant portion of its payments for services rendered from a limited number of government and commercial third-party payors, including Medicare, Blue Cross, Medicaid and various health maintenance organizations. The Hospital has not historically incurred any significant concentrated credit losses in the normal course of business.

(Continued)

(13) Malpractice and Other Litigation

Professional Liability/Medical Malpractice

Professional liability/medical malpractice coverage for the Hospital is supplied on a claims-made basis by Rhode Island Sound Enterprises Insurance Co., Ltd. (RISE), Lifespan's affiliated captive insurance company, which underwrites the medical malpractice risk of the Hospital. The adequacy of the coverage provided and the funding levels are reviewed annually by independent actuaries and consultants. The professional liability insurance provided by RISE has liability limits of $4,000 per claim with no annual aggregate. In addition, commercial umbrella excess insurance has been obtained to increase the professional liability limits to $20,000 per claim.

General Liability

General liability coverage is provided to the Hospital by RISE amounting to $4,000 per claim and $4,000 in the annual aggregate. Commercial excess liability insurance has been obtained by Lifespan which provides aggregate general liability coverage of $65,000.

Malpractice and Other Litigation

The Hospital has been named as a defendant in a number of pending actions seeking damages for alleged medical malpractice. In the opinion of management, any liability and legal defense costs resulting from these actions will be within the limits of the Hospital's malpractice insurance coverage provided by RISE and/or commercial excess carriers.

In addition to the actions discussed above, the Hospital is also involved in a number of miscellaneous suits and general liability suits arising in the course of business. After consultation with legal counsel, management estimates that these matters will be resolved without material adverse effect on the Hospital's future financial position or results from operations.

(14) Related-Party Transactions

The Hospital was charged a management fee by Lifespan of $19,993 and $17,518 in 2005 and 2004, respectively, representing approximately 22% and 21%, respectively, of Lifespan's operating expenses. Lifespan provides information, human resources, financial, and various other support services to the Hospital.

(Continued)

(In thousands)

(14) Related-Party Transactions (continued)

Included in other receivables and other accrued expenses are the following amounts due from (to) certain related entities at September 30:

	2005	2004
Other receivables:		
Newport Hospital	$ 90	$ 231
Other accrued expenses:		
Lifespan	$ (294)	$ (158)
RIH	(120)	(1,289)
Total	$ (414)	$ (1,447)

During the years ended September 30, 2005 and 2004, the Hospital received temporarily restricted net asset transfers from The Miriam Hospital Foundation (the Foundation) amounting to $4,142 and $1,250, respectively. In addition, the Hospital received grants from the Foundation amounting to $500 in both 2005 and 2004 in support of the Hospital's research activities. Such grants are included in other revenue.

The Foundation, whose sole corporate member is Lifespan Corporation, was established to engage in philanthropic activities to support the mission and purposes of Lifespan and the Hospital. Funds are distributed to the Hospital when purpose restrictions stipulated by donors are accomplished, or as determined by the Boards of Trustees of the Hospital and the Foundation. A summary of the Foundation's assets, liabilities, net assets, results of operations, and changes in net assets follows. The Hospital's interest in the net assets of the Foundation is reported as a noncurrent asset in the statements of financial position.

(Continued)

(In thousands)

(14) Related-Party Transactions (continued)

	2005	2004
Assets, principally assets limited as to use	$ 48,992	$ 45,966
Liabilities	$ 938	$ 923
Unrestricted net assets	35,806	32,016
Temporarily restricted net assets	6,434	7,593
Permanently restricted net assets	5,814	5,434
Total liabilities and net assets	$ 48,992	$ 45,966
Total unrestricted revenues, gains and other support	$ 2,833	$ 4,108
Total expenses	811	1,418
Excess of revenues over expenses	2,022	2,690
Other changes in unrestricted net assets	1,768	(1,238)
Unrestricted net assets, beginning of year	32,016	30,564
Unrestricted net assets, end of year	$ 35,806	$ 32,016
(Decrease) increase in temporarily restricted net assets	$ (1,159)	$ 4,030
Temporarily restricted net assets, beginning of year	7,593	3,563
Temporarily restricted net assets, end of year	$ 6,434	$ 7,593
Increase in permanently restricted net assets	$ 380	$ 1,246
Permanently restricted net assets, beginning of year	5,434	4,188
Permanently restricted net assets, end of year	$ 5,814	$ 5,434

There are no amounts payable from the Foundation to the Hospital at the end of 2005 and 2004.

(Continued)

(In thousands)

(15) Functional Expenses

The Hospital provides general health care services to residents within its geographic location. Expenses related to providing these services are as follows for the years ended September 30:

	2005	2004
Health care services	$ 224,993	$ 200,609
Research	24,718	28,060
General and administrative:		
Depreciation and amortization	7,978	8,044
Interest	3,083	3,135
License fees	6,623	6,561
Other	25,680	24,120
Total general and administrative	43,364	41,860
	$ 293,075	$ 270,529

THE MIRIAM HOSPITAL

Statements of Financial Position

March 31, 2006 and 2005

(In thousands)

Assets	March 31 2006	March 31 2005
Current assets:		
Cash and cash equivalents	$ 30,922	$ 26,595
Patient accounts receivable	37,885	39,531
Less allowance for doubtful accounts	(8,798)	(8,432)
Net patient accounts receivable	29,087	31,099
Other receivables	3,338	3,391
Total receivables	32,425	34,490
Assets limited as to use	1,124	1,228
Inventories	2,692	2,479
Prepaid expenses and other current assets	701	706
Total current assets	67,864	65,498
Interest in net assets of The Miriam Hospital Foundation	51,683	48,094
Assets limited as to use	103,797	89,547
Less amount required to meet current obligations	(1,124)	(1,228)
Noncurrent assets limited as to use	102,673	88,319
Property and equipment, net	90,869	76,562
Other assets:		
Deferred financing costs, net	1,508	1,278
Other noncurrent assets	694	1,550
Total other assets	2,202	2,828
Total assets	$ 315,291	$ 281,301

Liabilities and Net Assets	March 31 2006	March 31 2005
Current liabilities:		
Accounts payable	$ 5,939	$ 6,277
Accrued employee benefits and compensation	15,393	12,122
Other accrued expenses	3,270	2,498
Current portion of long-term debt	1,157	1,096
Current portion of estimated third-party payor settlements	12,662	9,383
Estimated health care benefit self-insurance costs	1,551	1,804
Total current liabilities	39,972	33,180
Long-term debt, net of current portion	53,426	51,506
Estimated third-party payor settlements, net of current portion	13,874	14,627
Other liabilities	7,400	7,345
Total liabilities	114,672	106,658
Net assets:		
Unrestricted	171,163	149,371
Temporarily restricted	23,489	19,774
Permanently restricted	5,967	5,498
Total net assets	200,619	174,643
Total liabilities and net assets	$ 315,291	$ 281,301

See accompanying notes to interim financial statements (unaudited).

THE MIRIAM HOSPITAL

Statements of Operations and Changes in Unrestricted Net Assets

(In thousands)

	Second Quarter Ended March 31		Six Months Ended March 31	
	2006	2005	2006	2005
Unrestricted revenues and other support:				
Net patient service revenue	$ 68,874	$ 68,046	$ 135,098	$ 132,436
Other revenue	3,356	3,100	6,617	6,203
Endowment earnings contributed toward community benefit	148	133	284	262
Net assets released from restrictions used for operations	285	207	534	440
Net assets released from restrictions used for research	4,742	5,624	9,932	11,194
Total unrestricted revenues and other support	77,405	77,110	152,465	150,535
Operating expenses:				
Compensation and benefits	37,589	35,621	75,388	70,180
Supplies and other expenses	20,152	20,664	40,762	41,169
Purchased services	8,631	8,316	16,852	16,324
Provision for bad debts	4,227	5,309	8,023	8,502
Depreciation and amortization	2,071	2,106	4,054	4,120
Interest	687	765	1,454	1,547
License fees	2,029	1,656	4,058	3,312
Total operating expenses	75,386	74,437	150,591	145,154
Income from operations	2,019	2,673	1,874	5,381
Nonoperating gains and losses:				
Net realized gains on sales of investments	1,443	660	2,735	1,162
Loss on advance refunding of debt	(3,673)	—	(3,673)	—
Other nonoperating gains	3	—	3	23
Total nonoperating (losses) gains, net	(2,227)	660	(935)	1,185
(Deficiency) excess of revenues over expenses	(208)	3,333	939	6,566
Other changes in unrestricted net assets:				
Net unrealized gains (losses) on investments	2,519	(1,213)	2,340	2,794
Net assets released from restrictions used for purchase of property and equipment	1,582	873	2,042	1,213
Other	1,475	(313)	2,112	1,938
Increase in unrestricted net assets	$ 5,368	$ 2,680	$ 7,433	$ 12,511

See accompanying notes to interim financial statements (unaudited).

THE MIRIAM HOSPITAL

Statements of Cash Flows

(In thousands)

	Second Quarter Ended March 31		Six Months Ended March 31	
	2006	2005	2006	2005
Cash flows from operating activities:				
Increase in net assets	$ 6,087	$ 833	$ 10,695	$ 12,671
Adjustments to reconcile increase in net assets to net cash provided by (used in) operating activities:				
Loss on advance refunding of debt	3,673	—	3,673	—
Net realized and unrealized gains (losses) on investments	(3,735)	689	(4,778)	(3,813)
Undistributed portion of change in interest in net assets of The Miriam Hospital Foundation	(1,873)	68	(3,629)	(3,051)
Temporarily restricted gifts, grants and bequests	(6,911)	(4,573)	(14,256)	(11,825)
Depreciation and amortization	2,071	2,106	4,054	4,120
Provision for estimated health care benefit self-insurance costs	4,370	3,744	8,148	6,923
Decrease in liabilities for estimated health care benefit self-insurance costs resulting from claims paid	(4,489)	(3,409)	(8,086)	(6,277)
Net increase in patient accounts receivable	(95)	(2,198)	(1,356)	(2,945)
Decrease in accounts payable	(962)	(746)	(1,267)	(436)
Increase (decrease) in accrued employee benefits and compensation	2,588	1,489	1,381	(9)
Increase (decrease) in other accrued expenses	1,367	197	557	(486)
Increase in estimated third-party payor settlements	2,134	2,852	1,036	3,824
(Decrease) increase in all other current and noncurrent assets and liabilities, net	(520)	(823)	654	1,033
Net cash provided by (used in) operating activities	3,705	229	(3,174)	(271)
Cash flows from investing activities:				
Purchase of property and equipment	(8,639)	(3,602)	(12,599)	(6,782)
Net decrease (increase) in trustee-held bond funds	759	(453)	649	(516)
Other net (increases) decreases in assets limited as to use	(1,289)	559	(3,351)	(1,013)
Net cash used in investing activities	(9,169)	(3,496)	(15,301)	(8,311)
Cash flows from financing activities:				
Proceeds from issuance of long-term debt	40,725	—	40,725	—
Payments to defease refunded bonds	(41,319)	—	(41,319)	—
Temporarily restricted gifts, grants and bequests	6,911	4,573	14,256	11,825
Net cash provided by financing activities	6,317	4,573	13,662	11,825
Net increase (decrease) in cash and cash equivalents	853	1,306	(4,813)	3,243
Cash and cash equivalents, beginning of period	30,069	25,289	35,735	23,352
Cash and cash equivalents, end of period	$ 30,922	$ 26,595	$ 30,922	$ 26,595

See accompanying notes to interim financial statements (unaudited).

The Miriam Hospital
Notes to Interim Financial Statements (Unaudited)
(In Thousands)

Note 1: The interim financial information furnished herein is unaudited; however, in the opinion of management, the information reflects all adjustments that are necessary to fairly state the financial position of The Miriam Hospital ("TMH"), the results of its operations and its cash flows for the periods indicated on the same basis as the audited financial statements. All the adjustments are of a normal recurring nature. These financial statements do not include all the information and footnote disclosures required by generally accepted accounting principles.

The Hospital presumes that users of this interim financial information have read or have access to TMH's audited financial statements for the preceding fiscal year, and that the adequacy of additional disclosure needed for a fair presentation may be determined in that context. Accordingly, footnotes and other disclosures that would substantially duplicate the disclosures contained in TMH's most recent audited financial statements have been omitted.

Note 2: The composition of assets limited as to use at March 31 is set forth in the following table:

	2006	2005
Internally board-designated	$ 88,160	$ 76,882
Held by trustee under bond indenture agreements	1,554	2,728
Temporarily restricted funds	14,083	9,937
Total	103,797	89,547
Less amount required to meet current obligations	(1,124)	(1,228)
Noncurrent assets limited as to use	$ 102,673	$ 88,319

(Continued)

(In Thousands)

Note 3: On February 14, 2006, Rhode Island Health and Educational Building Corporation issued, on behalf of the Lifespan Obligated Group (the Obligated Group), which consists of RIH and TMH, $192,135 of tax-exempt bonds (the 2006 A Bonds) for the purpose of advance refunding $123,405 and $65,315 of the Obligated Group's 1996 Bonds and 2002 Bonds, respectively. The advance refundings are allocated as follows:

	1996 Bonds	2002 Bonds
RIH	$ 101,809	$ 48,986
TMH	21,596	16,329
Total	$ 123,405	$ 65,315

The 2006 A Bonds are secured by a pledge of the gross receipts of RIH and TMH and by mortgage liens on RIH's and TMH's real property and all buildings, structures and improvements thereon. RIH and TMH are jointly and severally liable for repayment of the 2006 A Bonds, $153,324 and $38,811 of which has been recorded directly by RIH and TMH, respectively. Payment of the principal and interest on the 2006 A Bonds when due is guaranteed by a financial guaranty insurance policy issued by Financial Security Assurance, Inc. The 2006 A Bonds are due May 15, 2009 through 2032 in annual amounts ranging from $2,355 to $15,020 at rates ranging from 4% to 5%. Under the terms of the 2006 A Bonds, RIH and TMH are required to satisfy certain measures of financial performance as long as the bonds are outstanding.

The above advance refunding resulted in a nonoperating loss of $15,913 of which $12,240 and $3,673 was recorded in the February 2006 RIH and TMH financial statements, respectively.

B

Certificate of Need Application

Appendix B

Special Questions for Certificate Of Need Applications Involving the Provision of Services to Inpatients

All certificate of need applications, which involve the provision of services to inpatients, must be accompanied by responses to the questions posed herein.

Name of applicant: **The Miriam Hospital**

1. Are there programmatic alternatives to the provision of new institutional health services to inpatients as proposed herein which are superior in terms of:

   a. cost ____ Yes __X__ No
   b. efficiency ____ Yes __X__ No
   c. appropriateness ____ Yes __X__ No

2. For each No response in Question 1, discuss your finding that there are no programmatic alternatives superior to this proposal.

While conventional non-robotic surgery is an alternative to the proposed robotic surgery, non-robotic surgery alternatives are not superior to the use of robotic surgery technologies which involve range of motion and movement scaling not available with conventional non-robotic surgery. Thus, there are no superior programmatic alternatives.

3. For each Yes response in Question 1, identify the superior programmatic alternative to this proposal, and explain why that superior alternative was rejected in favor of this proposal.

   N/A

4. In the absence of provision to inpatients of the new institutional health services proposed herein, will patients encounter serious problems in obtaining care of the type proposed in terms of:

   a. availability __X__ Yes ___ No
   b. accessibility __X__ Yes ___ No
   c. cost __X__ Yes ___ No

5. If your response to either 4a or 4b is Yes, please comment on the problem on a separate sheet of paper and attach hereto.

While patients could opt for conventional forms of non-robotic surgery in the absence of robotic surgery, patients who would prefer robotic surgery would need to travel out-of-state to Connecticut or Massachusetts to obtain these procedures robotically as they would not be available or accessible in RI. The cost of the surgery for those patients would probably be higher than the cost of robotic surgery, due to the higher use of blood services associated with non-robotic surgery compared to robotic surgery. For those patients who would choose to travel out-of-state for a robotic procedure due to the lack of both the availability and accessibility of robotic surgery in RI, the cost of the procedure itself would most likely be less due to the lower use of blood services compared to that of non-robotic surgery, but there would also be additional expenses for travel and lodging with family members who accompany them having to spend more time away from work than if the service were available locally, none of which to the applicants knowledge would be reimbursed by Payors.

E

Certificate of Need Application

Appendix E

Acquisition of Health Care Equipment Valued in Excess of $1,000,000

Complete separate copies of this appendix for each piece of such equipment contained in this application.*

Name of Applicant: **The Miriam Hospital**

1. Type of Equipment: **Da Vinci S Surgical System**

2. Name of Manufacturer: **Intuitive Surgical**

3. Model Number: **S**

4. Cost of Equipment: **$1.7M**

5. Name and Address of Vendor: **Intuitive Surgical, Sunnyvale, CA**

6. Describe the clinical applications for which this equipment will be used. **Robotic minimally invasive prostatectomy, mitral valve repair, foregut surgery.**

7. Identify at least two similar makes or models of equipment which were considered for acquisition, and state your reasons for rejecting them in favor of this equipment. In your discussion include comparisons of capital costs, operating cost, maintenance considerations, etc. and any other factors which guided the decision-making. **No similar equipment available.**

8. For each piece of existing equipment to be replaced by this equipment, provide its date of acquisition, expected salvage value, remaining useful life, actual utilization for the last three years, and the ways in which the replacement equipment will be used or disposed of subsequent to acquisition of the replacement equipment.

9. Please state below the number of new full-time equivalent personnel by job category whom you will hire in order to operate this equipment.

No new full-time equivalent personnel are planned to be hired in order to operate this equipment.

Job Category	Number of FTE's	Payroll Expense
None	None	None

10. Please describe below your anticipated utilization for this equipment, both hours of operation and numbers of procedures, tests, etc. for each of the three fiscal years following acquisition of this equipment.

Fiscal Year	2007	2008	2009
Hours of Operation	7am – 7pm	7am – 7pm	7am – 7pm
Number of Procedures	50 (9 months)	120	140

* Information must be provided in response to these questions even if a specific vendor has not been agreed upon.